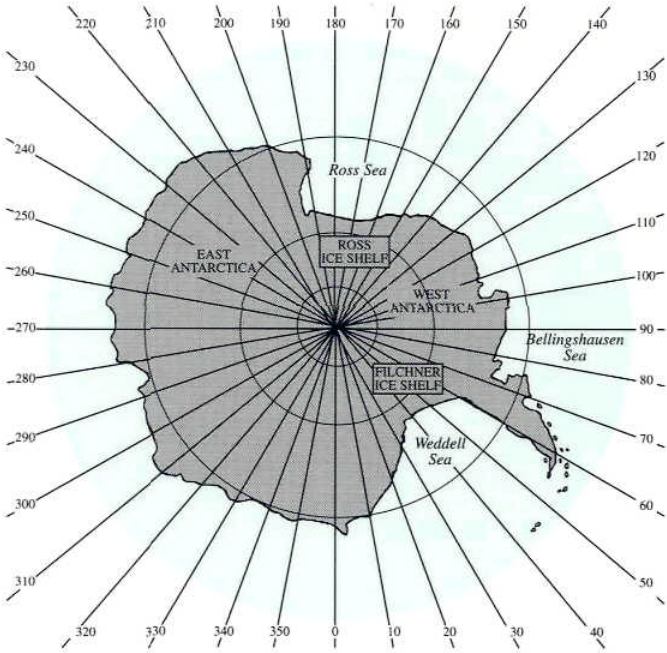
the Skeptical Inquirer

Ancient Antarctica Maps?
Claims vs. Evidence



Faith Healers Exposed / Folk Remedies
Fringe Dentistry / Air, Ions and Electricity
Pseudoscience About the Past / Ghostbusting
Woodbridge UFO / Boulder Conference

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the Skeptical Inquirer

THE SKEPTICAL INQUIRER is the official journal of the Committee for the Scientific Investigation of Claims of the Paranormal.

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ON THE COVER: Illustration from *EOS*, American Geophysical Union.

The Path Ahead: Opportunities, Challenges, and an Expanded View

WITH THIS ISSUE we begin our second decade. We are proud to note this milestone. Still, we consider the SKEPTICAL INQUIRER a youthful publication, its potential not fully tapped, challenges and opportunities ahead.

We have grown with each issue, but we are still a small publication by mass-media standards. This is as much an advantage as a handicap. Our special (that is, evaluative) approach to a fairly specific set of subjects—pseudoscience, fringe science, and the allegedly paranormal, plus the social, educational, and scientific issues surrounding these public fascinations—gives us a unique niche in periodical publishing.

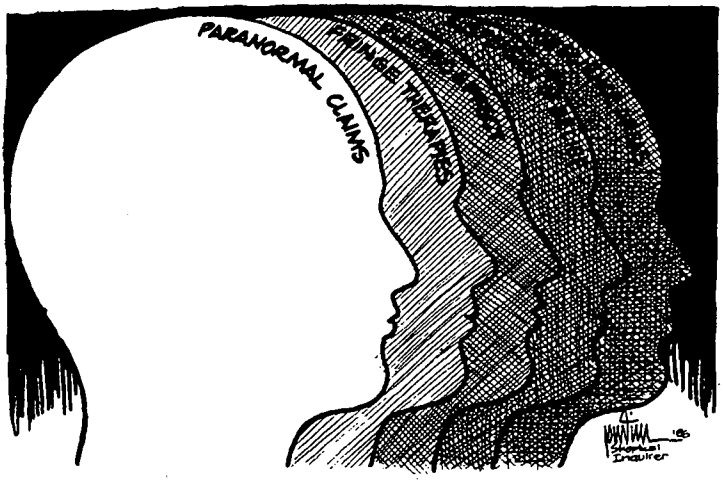
You, our readers, are our first and primary audience. Through you our reach broadens and multiplies. Teachers and scholars use the articles in classrooms and research. News media report the investigations and convey the scientific viewpoint. The many new local and international groups—some of them amazingly active and effective—draw upon studies we publish and do their own investigations. Many of you share articles with friends and acquaintances. So, despite our still relatively small size, we have become fairly well known. We have made an impact. Yet there is so much more to do.

* * * * *

We have written before in these occasional columns of the need to chart trends in the paranormal and fringe sciences. Steven Dutch's article "Four Decades of Fringe Literature" in our Summer issue illuminated this well. The number of books published on the occult, astrology, UFOs, psychics, and other fringe topics rose from the late 1960s and throughout the 1970s. Since 1981 there has been a sharp plunge. From this dramatic decline one might wrongly think fringe science has virtually gone away. We certainly no longer see the international best-selling books of fringe science, such as Velikovsky's historic-era worlds-in-collision, von Däniken's ancient-astronaut scenarios, and the Bermuda Triangle books of the mid-1970s. There *has* been a dropoff in interest in some of these subjects. But other fringe topics have taken their places, and they don't depend on books.

Look what we have now.

"Psychics" and their claims are at least as visible, popular, and



accepted, even by the educated public, as ever. Psychics have little need for books. They promulgate their wares through word of mouth, local radio talk-shows, the now-ubiquitous "psychic fairs," and the often fawning attention of newspaper and magazine feature writers.

Astrology has similar leverage. Astrologers need not rely on books when their columns appear in nearly every daily newspaper in America.

A variety of newer topics and influences have emerged, only a few through books.

Creationists operate effectively through fundamentalist organizations; TV evangelism; mass mailings of literature, booklets, and brochures; letter-writing campaigns; and highly organized political pressure on school boards, textbook-selection committees, and state legislatures.

If global geophysical scenarios are no longer of much interest to the fringe, all matters of the self are. Health care, medicine, and the "self-realization" movements have been invaded by the fringe. Usually this is with the willing complicity of the consumer/patient, who naturally seeks help from wherever offered. The stronger the claims of therapeutic value, the more attractive the appeal. Psychic healing, chiropractic, iridology, homeopathy, acupuncture, human auras, hair analysis, diet cure-alls, arthritis cures, nutrition fads, orgone energy (again!), visual therapies for cancer, dream interpretation, reflexology, crystal therapy, graphology, subliminal self-help tapes, applied kinesiology, polarity therapy, naturopathy, past-lives regressions—all these popular enthusi-

asms cry out for calm, careful, and, yes, skeptical analysis.

* * * * *

The SKEPTICAL INQUIRER intends to move more aggressively into these areas. For example, we will try to present balanced appraisals of some of the fringe therapies that capture the public's interest. In doing so we will try to recognize what may be commendable about any one of them in addition to what aspects have little if any scientific support. This will involve getting into some gray areas and subtle issues of mind and health. Among these complications are (1) the role our attitudes may play in recovering from ailments, and the limits of that role; (2) the need to recognize and understand the placebo effect; (3) the undisputed fact that the body's defense mechanisms cure most ailments on their own; and (4) the human tendency to impute cause and effect when recovery follows a fringe treatment. Karl Sabbagh's article "The Psychopathology of Fringe Medicine" last Winter helped outline this approach. In this issue, Frank Reuter's article on folk remedies and human belief-systems continues this discussion, while John Dodes's article on dentistry and pseudoscience reports on the surprising spread of fringe therapies into what had seemed a conventional area of medicine.

* * * * *

And this brings us to another aspect of our expanding interests. We hope to devote more effort to understanding and explaining how and why fringe claims of every sort have so much appeal. It is not enough to show, even carefully and persuasively, that a particular fringe idea is factually invalid (if it is). What is even more interesting is why such fads are believed so strongly despite that. This requires a willingness to see things from the point of view of those who hold the beliefs. Their appeal goes to the very heart of the human condition—our hopes and aspirations, our deepest fears and uncertainties. Several of our Tenth Anniversary Essays and some recent articles have explored these matters with considerable insight, and we will continue that exploration in the future.

* * * * *

We will also occasionally delve into nonparanormal claims along *both* sides of the fuzzy boundaries between science and nonscience. The hope is that light cast on one may better illuminate the other, highlighting the

contrasts. Martin Gardner's column in this issue, on Tommy Gold, explores some of that territory. So did his column on science, mysteries, and the quest for evidence in the Summer issue. David Jolly's article on claims of ancient mapping of Antarctica in this issue reports on a topic of interest both within earth science and geography and, across the border, to the fringe.

* * * * *

One of the most gratifying pleasures of editing a publication is the mail from readers. Whether informal notes or letters to the editor, they are symbols of an involved readership. I've always thought it would be fun—maybe even enlightening—to put out a publication consisting of nothing but letters, populism at its best. But we can't. We get lots of mail, and all of it is read with interest. Unfortunately, not all the letters can be given personal replies, but please know that your suggestions and comments are important in shaping the SKEPTICAL INQUIRER. The volume of letters submitted for publication exceeds by several times the space we can devote to them (despite our generous allotment compared with many publications). So we urge those who wish to have letters published to keep them brief and well focused.

* * * * *

Speaking of readers, many of you are new to the SKEPTICAL INQUIRER. We welcome you and hope you will find this a rewarding association. You have joined longtime *SI* readers who tend to be strong supporters of our efforts. New readers may enthusiastically welcome our evaluative approach. (In fact, many of you send for all of the back issues as soon as you get your first.) Others find that a questioning approach to perhaps previously unquestioned assumptions is disturbing and even unwelcome, or feel that we fall short of our goals. We have no illusions that in an emotion-laden area like this we can be all things to all people. But we hope all new readers will appreciate that the effort to conduct careful appraisals and foster critical thinking and a scientific attitude is a worthy goal. We welcome your suggestions and comments.

* * * * *

In addition to the expanded interests mentioned earlier, we also wish to find more ways to bring a *positive* approach to our inquiries. Through our investigations we seek to understand human behavior, to see how

our minds work. We want to find ways to show that science is not some narrow, cold, inaccessible, mechanical approach reserved only for specialists (as too much of the public mistakenly assumes) but a human adventure. The quest to discover the nature of nature is both a high intellectual calling and a very human activity. It deals with awesome mysteries and mundane (but essential) methodologies. The quest draws upon the creativity, insight, determination, and sometimes downright good luck of talented investigators. The day-to-day progress is slow and typified by wrong turns and dead ends. Controversies and disputes abound, yet it is a cooperative activity that depends on the contributions of colleagues (and competitors) all over the world. The special language of every field may seem frustratingly opaque, yet the broad ideas, concepts, and discoveries of science are accessible to anyone—and they are anything but dull. They are endlessly challenging, exciting, and mind-expanding. False mysteries pale in comparison to the real ones nature holds in store, but sometimes the differences can be distinguished only after the fact—after a lot of difficult research has been done. We hope to convey some of that sense of excitement and challenge about science and the ultimate mysteries of nature. These are the real frontiers.

—*Kendrick Frazier,* Editor

Explaining Rather Than Debunking

Too many skeptics view their mission as one of "debunking" nonsense and superstition, rather than explaining the phenomenon. When asked about astrology, for instance, they will say "Oh, there have been many scientific studies that show astrology does not work. It is inconsistent with the law of universal gravitation." This sort of approach does not work with open-minded believers, because they know astrology does work. The skeptic will only lose by denying an experience that someone genuinely has. A better approach would be to say that astrology does work, but it works for different reasons, and not the ones that the astrologers generally believe. The skeptic should then ask the believer to think of a way to test the validity of astrology. Rather than telling people the whole solution, help them to figure out the solution themselves. This approach does not deny a person's thinking skills. So the method to be used is one of explaining rather than debunking. Explaining is much more positive and people are much more apt to listen. Just maybe these thinking skills will help people with issues other than pseudoscience. After all, that is our mission.

—Al Seckel, in *Laser* (Southern California Skeptics newsletter), December 1985/January 1986

Join us in Los Angeles

for the

1987 Annual CSICOP Conference

at the

California Institute of Technology
in Pasadena

Friday and Saturday, April 3 and 4

KEYNOTE SPEAKER

Carl Sagan

Friday night at 8:00 P.M.

Friday Sessions

Extraterrestrial Intelligence: What Are the Probabilities?
Animal Speech: Fact or Illusion?

Saturday Sessions

Holistic Medicine Examined
Psychic Scams
Hypnosis Explained
Spontaneous Human Combustion
Astrology

Watch for details in the next issue

For more information, write to MARY ROSE HAYS, Committee for the Scientific Investigation of the Claims of the Paranormal (CSICOP), Box 229, Buffalo, New York 14215-0229. Tel.: 716-834-3222.

News and Comment

CSICOP Boulder '86: Science and Pseudoscience, Hypnosis and 'Past Lives,' QM and Psi

The virtue of science as a system is that it can and does sort out its errors. Pseudoscience does not.

Stephen Jay Gould

You can light a fire in the brain with lots of different stimuli.

Ronald K. Siegel

TO THE BASE of the Rocky Mountains they came, the participants and audiences of the Tenth Anniversary Conference of the Committee for the Scientific Investigation of Claims of the Paranormal (CSICOP). On the University of Colorado campus in Boulder, two busy days of sessions devoted to the theme "Science and Pseudoscience" skeptically inquired into everything from parapsychology to hypnotic regression, reincarnation, life after life, creationism, UFOs, bias in science, and the alleged connection between psi phenomena and quantum mechanics.

The fourth in a now annual series (following University College London in 1985, Stanford in 1984, and SUNY-Buffalo in 1983), it was the biggest CSICOP conference yet. Six hundred registrants came from at least 43 states and 5 countries, not to mention a standing-room-only crowd of 1,200 in the University's Glenn Miller Ballroom to hear Stephen Jay Gould's lively keynote address on bias in science and the sometimes subtle distinctions between science and pseudoscience. (See separate story.)

In addition there was a pre-meeting press conference in Denver, an awards banquet, an entire evening of magic acts that entertained and informed about the nature of deception, and an informal Sunday morning session where leaders of local and international groups exchanged ideas on common concerns.

One of those groups, the Colorado Organization for a Rational Alternative to Pseudoscience, co-sponsored the conference. CO-RAP's volunteers and CSICOP's Buffalo staff made it a smooth-running affair, logistically, socially, and intellectually.

Colorado has had its share of involvement in these subjects—bad and good. It was, after all, the home of Bridey Murphy, and it has been a center of cattle-mutilation reports and various other "New Age" activity. On the plus side, the University of Colorado conducted for the Air Force the famous and controversial Condon UFO study, which struggled to bring some sense of evaluative rigor and proportion to that subject. (Philip J. Klass's conference paper about the study appeared in our Summer issue.)

Paul Kurtz, founder and chairman of CSICOP (the next evening he was presented a surprise award for these efforts) opened the conference with remarks about CSICOP's Tenth Anniversary and

the mission to examine paranormal claims. He noted the widely different levels of seriousness with which those who assess fringe science and the paranormal must cope. "One element *is* hilarious," he noted. In contrast, there are "certain areas in which it is downright dangerous." As for CSICOP's mission, "We try to present the truth. We don't see anything negative about that."

* * * * *

Caltech physicist Murray Gell-Mann, a Nobel laureate and a CSICOP Fellow, offered some valuable suggestions about skeptical inquiry generally, then plunged into the subject of quantum mechanics and psi phenomena. Nonphysicists have many misconceptions about QM, he noted. "There is a feeling that quantum mechanics is so weird that anything goes." Not true, said Gell-Mann. Strange as quantum mechanics may seem, QM theory would have to be considerably modified before it could accommodate supposed psychic effects. And in its present form, QM theory "has met all challenges so far and has recently scored some remarkable apparent successes in the attempt to unify all the particles and forces of nature."

Gell-Mann agreed that quantum mechanics *is* counter-intuitive but emphasized that "it's not psychic or anything like that." He said the paradox of QM most frequently cited by psi proponents is not "a spooky action at a distance," as Einstein worried. "There is no action at a distance involved . . . *unless* you add it." Gell-Mann was open-minded toward the experiments of Helmut Schmidt, who has reported results Schmidt interprets as evidence that a psychic subject can influence a random generator based on radioactive decays. He offered no judgment about the validity of Schmidt's experiments, and he called for outside skeptics to participate in the design of some of them in the future. But he said

Andrew Skolnick

Kurtz with 10th-Anniversary cake.

skeptics of Schmidt's claims should not take comfort from the fact that the single quantum events that Schmidt says are being modified are predicted only statistically. "It is a major revolution in physics—if it turns out to be right. I for one would shed no tears if it turns out that there is a major modification of this kind in physics. I think it would be very amusing."

Schmidt, of the Mind Science Foundation in San Antonio, followed with a summary of several series of those experiments. Included among them are experiments involving tens of thousands of electronic flips that achieved success rates the odds against which were calculated at 1,000 to 1 and even, in one series, 10 million to 1. "The good news," he said, "is that there exist some effects that are exciting from a fundamental viewpoint." The bad news is that "the effects are very weak, so the chance of some useful applications is not very great. . . . The main thing to do is just do more experiments," he said, and do everything possible to exclude experimenter bias, fraud, and blind spots.

Confessions of a Magician

IT WAS Saturday night—the end of the conference. The evening's festivities were billed as a magic show. I was introduced as a magician.

No, I do not do the standard magic tricks one comes to expect from a magician. I avoid the standard and the expected, and so do most performing magicians.

The audience was highly intelligent and skeptical to a fault. Surely they would understand that this magician, participating in the magic show, would be doing magic. Most assuredly they would not attribute to me powers that defy reason. Not this audience! Or would they?

The time: Saturday evening, April 26, 1986.

The place: The University of Colorado at Boulder.

The conference sponsor: The Committee for the Scientific Investigation of Claims of the Paranormal.

I explained the story of Clever Hans, the horse that scientists from around the world once believed could add and subtract. He would stomp out the answers with his hoof. When he reached the correct answer, the viewers—his handlers, the curious, the believers, and even the skilled scientists—would relax just a bit. Hans could and did perceive this. That was his signal to stop stomping his hoof. Clever horse, that Hans.

I then had three people from the audience each pick a card from my deck of playing cards. I told them that I would call out the names of the cards from the deck and requested that they try not to react when I named their cards. I explained that I would try to pick up their body language, saying: "I figured if a horse could do it, I could, too."

Prior to the presentation, it never occurred to me that anyone would think anything other than a magic performance would take place. However, based upon feedback, it appears that I pulled off the ultimate magic stunt! Although I was appearing as a magician in a magic show, the audience was led to believe that I was doing something other than magic.

University of Colorado physicist and space scientist George Lawrence spoke briefly. Lawrence has worked extensively with random-event generators. Such electronic instruments tend to be unstable and to get signals from other things, he said. "I had a heck of a time getting all the residual biases out of my system." Schmidt's effects "are near the level of noise," he said, "so I'm unconvinced." Schmidt protested these and other criticisms by Lawrence. Gell-Mann ended the unfortunately brief discussion (the numerous papers on the first afternoon allowed little time for questions) with a succinct summary: "This stuff is either right or wrong. If it's right, it's a major thing. If it's wrong, it's nothing."

* * * * *

With this good start, the conference continued its explorations. British parapsychologist Susan Blackmore (introduced by moderator Ray Hyman as a person of true intellectual integrity) gave a lively talk on her conversion to skepticism. After she had an "out-of-body experience" that seemed personally real she began a research program of experiments

The more I think about that, the stranger it becomes.

For instance, a lengthy and otherwise excellent newspaper article about the conference by a science journalist led off with several column-inches about Clever Hans. Then it described my presentation: "The three stood amid an audience of hundreds while Steiner briskly named the 52 cards: 'Spades ace, two, three. . . .' Then he correctly identified all three cards. . . . When Steiner's litany named their cards, the three pickers had responded in ways imperceptible to almost everyone but him."

All right, folks. What are my obligations here? Should I confess that this magician, introduced as a magician, performing in a magic show, actually deceived you? Wasn't that my assignment?

We skeptics chide the believers. We point out that they protect their self-esteem by claiming something "psychic." We hypothesize that they find that approach easier on their fragile egos than to admit that they were fooled, that they do not understand and cannot explain what happened.

And what about the skeptics? From appearances and discussion, it seems that many of them bought the whole program about Clever Hans. I timed myself: I recited the entire deck of cards in under 14 seconds. That is four cards per second. And there were three people to be observed in various parts of the spacious dining hall. Did they pause at all to ponder how long it would take each of them to exhibit recognizable bodily reactions after hearing the names of their cards? Could each one hear, absorb, understand, and react in a clearly discernible manner in less than one-quarter of one second? Could I accurately perceive and pinpoint such split-second reactions from all three people scattered about the room?

If I had told that audience that I was a "psychic," they would not have believed me. However, many of the assembled skeptics apparently found it easier to believe that I am a horse than that they were fooled by a magician.

—*Robert A. Steiner*

to try to understand what had happened. Results based on the psi hypothesis were uniformly negative. That led to a variety of deeper questions about the nature of such seemingly profound "experiences" and the shortcomings of parapsychology. She concluded that when the mind-body system is stressed and lacks enough sensory input to interpret outside events correctly it often builds a new model of what it *thinks* should be happening from *memory*. This frequently may involve seeing a bird's-eye view of oneself, an experience that seems very real. She concluded that the psi hypothesis for such experiences is unproductive and leads to "ever more boring questions."

* * * * *

This led into an entire session on similar experiences—ones that are often interpreted as signs of reincarnation, past lives, or life after life. Speakers included Leo Sprinkle, a Wyoming psychologist who titled his talk "Confessions of a Past-Lives Therapist"; psychopharmacologist Ronald K. Siegel of the Los Angeles Veterans Administration hospital; Carleton University psychologist

Siegel: Infinite brain stimuli.

Spanos: Misconceptions about hypnosis.

Nicholas S. Spanos and University of Pittsburgh linguistics professor Sarah Grey Thomason.

Sprinkle (who stressed that his university asks not to be associated with his *after-hours past-life therapy and reincarnation* research) described his experiences with self-hypnosis (which he feels led to his own self-improvement) and past-life therapy with various students. The vividness and emotional impact of the recounted "memories"—his own included—began to make him fear, think that reincarnation might be real. Sprinkle feels the evidence is sufficient to *permit* a personal belief in reincarnation but not to *compel* such belief. As for himself, he said that "the tentative acceptance of the hypothesis that I have lived many lives" has made him a less arrogant, more compassionate, more forgiving person. To a questioner skeptical of this hypothesis, Sprinkle said he could not reject his own experiences. The questioner pointed out that he need not reject his experiences, only his *interpretations* of them. Sprinkle agreed, but said he was not ready to do that.

Spanos began his talk with a question: "All of us are able to construct fantasies and do it with great regularity. Why is it that we would believe that fantasies constructed under hypnosis reflect actual past lives?" Misconceptions about hypnosis aid that misperception, he said. Hypnosis has its uses, but it is not a magic doorway. In fact, he said, people under hypnosis are acting in the way they think one under hypnosis should act. For instance, *numerous studies show that, in hypnotic* age regression, "the person behaves the way he believes the child of the age to which he's regressed will behave." If the behavior at a given age is subtle, "the adults get it wrong." Similar things happen with age regression to past lives.

Siegel reported on a variety of experiments with drugs on trained volunteer subjects in a controlled hospital setting. They show that drug-induced visions are similar to visions recounted in other situations. For example, our memory often contains fleeting images of ourselves. "That's how they're stored in the brain," said Siegel. Seemingly transcendental and "near-death"-like experiences show many of the same manifestations drug-induced hallucinations do. "Our brains are pretty much wired the same ways, so we have a finite number of responses, but there are an almost infinite number of stimuli," said Siegel. He proposed that the most parsimonious explanation for all such experiences is that they are a general reaction pattern of the central nervous system.

Thomason examined parapsychologist Ian Stevenson's linguistic evidence

claimed to lend support to the reality of reincarnation. She praised Stevenson's integrity and his attempts to exclude fraud. "Yet his linguistic evidence is completely unconvincing." One woman was said to have lived a past life in Switzerland; an unexplained knowledge of German was the evidence. Yet, said Thomason, it is apparent that "Gretchen" knows only a handful of German words, her German grammar is nonexistent, and she cannot converse in German. Many of the questions she answered required only yes or no responses, with a 50–50 chance of being right. "And since it's *her* past life, nobody knows what's right anyway." When more complex questions are put to her in German, "there's no evidence she knows what the interviewer is talking about." Said Thomason, "His subjects [Stevenson's] show no evidence *of any exposure to Swiss and German in any* lifetime, past or present."

* * * * *

Evolution and creationism was also on the docket. University of Colorado biologist William V. Mayer and anthropologist Eugenie C. Scott gave wide-ranging reviews of the arguments and the educational, social, and journalistic issues revolving around creationists' highly active anti-evolution campaigns. While creationists have lost the big cases, said Mayer, they continue to have success at the local level. "Local schools and local teachers need our support if the drumfire of creationist pressure at the local level is to be muted."

* * * * *

The conference concluded with an evening magic show. Presentations and demonstrations were made by James Randi (who showed videotapes of his investigations of faith-healer Peter Popoff revealed earlier that week on the "Tonight Show"), Henry Gordon of Toronto; Douglas Stalker, who gave his "Captain Ray of Light" act, in costume, showing how you too can become rich by concocting new pseudosciences; and Robert Steiner (see accompanying story).

—Kendrick Frazier

Gould, MacCready Lead List of CSICOP Award Recipients

What a great design engineer Mother Nature is! She is just terrific!

Paul MacCready

STEPHEN JAY Gould, recipient of the CSICOP 1986 In Praise of Reason Award, and Paul MacCready, recipient of the first CSICOP Frontiers of Science and Technology Award, each gave invited talks at the Tenth Anniversary Conference in Boulder.

Gould's evening keynote address ranged widely over his interests in demonstrating often little-recognized

CO-RAP

MacCready: Get people to wonder.

CSICOP Awards

Following are the recipients of CSICOP Awards for 1986, presented at the University of Colorado, Boulder, April 26, 1986:

In Praise of Reason Award—Stephen Jay Gould, Harvard University. "In recognition of his long-standing contributions to the use of the methods of critical inquiry, scientific evidence, and reason in evaluating claims to knowledge and solving social problems."

Frontiers of Science & Technology Award—Paul MacCready, AeroVironment, Inc. "In recognition of his innovative and creative contributions to technology and his outstanding defense of critical thinking."

Founder Award—Paul Kurtz, founder and chairman, CSICOP. "In recognition of your wisdom, courage, and foresight in establishing and leading the world's first public education organization devoted to distinguishing science from pseudoscience" [surprise award from Executive Council].

Responsibility in Journalism Award—Boyce Rensberger, science reporter, *Washington Post*. "In recognition of contributions to fair and balanced reporting of paranormal claims."

Responsibility in Journalism Award—Ward Lucas, anchor and investigative reporter, KUSA-TV, Channel 9, Denver. "In recognition of contributions to fair and balanced reporting of paranormal claims."

biases in science (past and present), the differences between science and pseudoscience, the intellectual bankruptcy of the creationist movement, the utility of errors and quirks as historical tracers, and the current intellectual fervor in evolutionary science.

As he does in his books and columns, Gould emphasized that science is "an intensely human enterprise," embedded in cultural context and psychological predispositions. These have their salutary side in science but can also lead to error. "Bias—the flip side of the favorable side of cultural context—is as inextricably wound into science as is human personality and culture."

Nevertheless, "there is a real world out there" to be understood and through science "we get there, fitfully to be sure."

"The one thing about science as an enterprise is that there is a possibility of identifying the bias," said Gould. "With what I call pseudoscience there's no hope at all. There's true blindness. There's no way out. None at all. Except exposure by people who come from the outside. And that's again the role of this organization."

"We must know and understand our biases" and be "constantly and rigorously vigilant" in scrutinizing them.

He sketched a taxonomy of bias, "from worst to least pernicious":

1. Fraud. "Conscious messing around. . . . Fraud makes me angry." Scientists (himself included) have to believe in their colleagues and graduate students. "It's a

shared trust." When they can't the whole scientific enterprise is damaged.

2. Finagling. "Unconscious messing around." More common than fraud.

3. Selective citation, as a result of social and personal biases. "You're reporting data in an odd context or reporting only some of it." Quite common.

4. Lousy argument. "When you're just so blinded by something you believe in so strongly" that you make an illogical argument that you wouldn't make otherwise. Lousy argument "will never go away."

Paul MacCready, recipient of aviation's prestigious Kremer Award for development of the Gossamer Condor (he's sometimes called the father of human-powered flight), described his Giant Pterodactyl Project, for the Smithsonian Institution. One reason he takes on such projects, he said, is to get young people everywhere excited and turned on to the marvelous engineering designs of the natural world and the potentials of their own creativity.

"Nature does just such amazing things," he said. Projects like these stimulate the imagination and get people to wonder and to think—whether about ways to duplicate nature's designs or about ways to solve the world's problems. He feels most of these problems are related to the human mind and is active in many projects to develop thinking skills—to improve creativity and "make your mind more useful."

MacCready said he's thankful to be a part of CSICOP "and its mind-opening ideas," and he may next seek ideas on how one might achieve "animal-powered flight"—using some land animal without wings to power a manmade craft. "It would be very educational. I hope to get more of these kinds of things into the schools, to get people and the media excited—and its going to be a better world."

—*K.F.*

Psychic's $1-Million Jury Award: The Testimony Not Given

Judy Richardson (Haimes) "says she acts as a medium, a bridge, a conduit between the physical and the spirit worlds. She has no control over what, if any, spirits use her for communication. She has no knowledge of what transpires while she is in a trance."

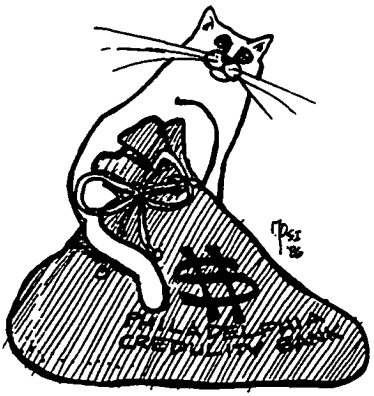
—From a 1973 news article

UNDER CERTAIN circumstances, James Randi says, he has the power to predict the future—even to make people disappear.

The circumstances are these: Put a tealeaf reader or a psychic or a so-called medium in the same public arena with him. Randi's unwavering prediction: They'll squirm and sweat every time and then make a break for the nearest exit.

Judith Richardson Haimes, a former New Castle, Delaware, resident who claims to be a psychic, was awarded almost $1 million by a Philadelphia jury recently in connection with a CAT scan she underwent at Temple University Hospital in 1976.

Before she underwent the scan, she listed herself as a "psychic consultant" and operated out of an office suite on Christiana Road. She said she was able



to read auras, conduct séances, observe the past and the future, and help police solve crimes.

But Haimes says that once the CAT scan was done, she suffered headaches so severe that they effectively put her out of business. Murderers everywhere presumably breathed a sigh of relief. The police were left to their own devices.

James Randi—who was to have testified against Haimes in the case—calls her "a low-level flim-flam artist." "Psychic consultant," he says, is just a fancy name for reader/adviser. "She's a fortune teller, that's all."

For many years, the relentless Randi has been the scourge of those who indulge in the occult. A chief investigator for the Committee for the Scientific Investigation of Claims of the Paranormal, he has a standing offer to bestow $10,000 on anyone who can conclusively demonstrate psychic powers. In 21 years, no one has qualified for the cash.

Randi, who keeps dossiers on all who claim paranormal powers, says that nationally Haimes "is a nobody in the trade."

Today, Randi and Haimes live on opposite sides of the Florida peninsula, she in Clearwater on the Gulf, and he near Fort Lauderdale.

The judge who conducted the malpractice trial specifically directed the jury to disregard Haimes's claims of psychic powers and to decide only whether there had been culpability on the part of the doctor and the hospital in treating her complaints.

Randi thinks that was unfortunate, because while the judge's intentions were good, his ruling allowed Haimes's psychic claims to linger unchallenged in the minds of the jurors, depriving Randi of an opportunity to prove his contention that Haimes has no powers any more extraordinary than those of "a good actress. My evidence would have refuted her evidence 100 percent," he says.

"Here was the jury believing that she had these wonderful powers. They would have been relieved of any such delusions if I'd been allowed to testify."

Randi says that as soon as Haimes, her husband, and her attorney saw him show up in court, "they made all kinds of objections, asking that I be excluded from the courtoom, that I not be allowed to testify as a witness."

He says that Haimes, in common with all psychics, complained of "negative vibrations" when he was around. "Negative vibrations," he scoffs. "That translates into truth."

Randi said Haimes "would not sit still for a simple test" he proposed "on the simplest of her claims—that as soon as she looked at any object, she could see an aura."

According to Randi, Haimes's claim to be able to predict the future is ludicrous. "She made a series of predictions in 1976 on things she said would take place in 1977. She was wrong in every last one of them which dealt in specifics."

Examples:

—Rose Kennedy will die in 1977 after a long illness.

—Richard Nixon will expire in the near future.

—An answer to what happened to Jimmy Hoffa will be found in 1977.

Randi says the most important piece of evidence Haimes had to support her psychic claims involved information she gave a certain police officer investigating a missing-person crime—information "she supposedly could not have known or guessed. But it turns out everything he says she told him, he actually told her.

"That cop would have looked like an awful fool had he appeared in court. He would have died of embarrassment before I got through."

When she practiced as a psychic in Delaware under the name of Judy Richardson, Haimes used to say that conducting séances frightened her, a fear, she said, that could not be pinpointed.

It's easier to pinpoint her fears today.

Her biggest may be that somebody will put a hex on Judge Leon Katz and compel him to set aside the verdict that made her a millionaire.

—Bob Leary

Bob Leary is senior reporter for the Wilmington (Del.) News-Journal *papers, where this article originally appeared. Reprinted by permission.*
(On August 7, 1986, Judge Katz overturned the jury award, calling it "grossly excessive" and not based on the evidence. He ordered a new trial.—ED.)

The Inauspicious Resurrection Of Magic Circle's Occult Body

THE OCCULT COMMITTEE of Britain's Magic Circle, defunct for the past 25 years, has now been resurrected. An offer of £30,000 has been made to anyone who can successfully demonstrate psychic abilities.

In April of this year, seven candidates performed in the Magic Circle's small theater. It turned out to be three hours of suffocating banality, with more questions than answers: "Is there a Billy or Willy on this side of the hall?" "Have you had a slight distraction of late?" "Are you a member of something?" "Are you putting on a bit of weight?" "Have you ever been lonely?"

Much of the material took one back almost 40 years to Bertram R. Forer's all-purpose Personality Sketch: a cobbling together of generalities and trivia that could be interpreted in different ways to suit almost anyone. Advice was dispensed with shotgun precision: "Be careful." "Protect your money." "You're on the wrong diet." "You need exercise."

Most candidates used up a lot of their allotted time with details of their life history and claims of past successes. One woman screwed up her face several times and claimed to take on the appearance of Churchill, Mountbatten, and Queen Victoria—a process she dignified with the term *transfiguration*. One man handed out a deck of cards and asked members of the audience to choose any card. Number of attempts—three; number of failures—three.

We were treated to pseudophysics: "Physicists call 'the other side' the *W factor*." And pseudobiology: "I commandeer your cell energy."

It was made clear to the audience that the candidates were "not here to be tested." On the other hand, they were not there to give "a show" either. It was not clear just what they were there for, or how anyone was going to settle any arguments about claims of success. Complete tolerance was asked for repeatedly on behalf of the candidates and it was obvious that skepticism was unwelcome.

The next stage, far from introducing controls, was to be "more relaxed," with dimmer lighting and the exclusion of skeptics.

In brief, the proceedings brought to mind a long-cherished entry from Ambrose Bierce's *Devil's Dictionary*: "Clairvoyant, n. A person, commonly a woman, who has the power of seeing that

which is invisible to her patron—namely, that he is a blockhead."

—*Lewis Jones*

Lewis Jones is a member of the U.K. branch of CSICOP.

Scholars Assess Cult Archaeology, Creationism

PSEUDOSCIENCE, AS it relates to the study of the human past, was the subject of a well-attended symposium, "Cult Archaeology and Creationism: Assessing and Responding to Pseudoscientific Beliefs About the Past," at the fifty-first annual meeting of the Society for American Archaeology in New Orleans, April 23-27, 1986. Co-organized by anthropologists Frank Harrold, Ken Feder, and Luanne Hudson, the symposium reflected a multidisciplinary effort to assess the nature of pseudoscientific archaeology and creationism, to measure student acceptance of pseudoscientific claims about the human past, and to prepare educational strategies in response to unscientific speculation about human prehistory. The fields of anthropology, sociology, history, and psychology were represented by the participants, several of whom were SKEPTICAL INQUIRER authors.

Three of the papers focused on a questionnaire survey related to student acceptance of pseudoscientific archaeology and creationism. The survey was administered to a sample of about 1,000 college students in California, Connecticut, and Texas. Not unexpectedly, the Texas students exhibited a greater level of belief in creationist claims than did either of the other two groups. Surprisingly, the California and Connecticut students were about the same in their acceptance of cult archaeological claims (e.g., ancient astronauts, Atlantis, psychic archaeology). Unfortunately, students in all three geographic subsamples exhibited a high level of credulity about most pseudoscientific claims.

Other papers focused on student belief levels regarding unsubstantiated phenomena, the published responses to creationism, and the effectiveness of classroom responses to pseudoscience of all kinds. A list of the symposium participants and the titles of their papers follows:

— William H. Stiebing, Jr. (University of New Orleans), "The Nature and Danger of Cult Archaeology"

— Thomas Gray (Concordia University, Montreal), "Psychological Studies of Belief in Unsubstantiated Phenomena"

— Kenneth L. Feder (Central Connecticut State University), "Pseudoarchaeology and Creationism: A Coordinated Research Project"

— Luanne Hudson and Bernard Means (Occidental College, Los Angeles), "East Is East and West Is West? A Regional Comparison of Cult Archaeology Belief Patterns"

— Francis B. Harrold and Raymond A. Eve (University of Texas, Arlington), "Patterns of Creationist Belief Among College Students"

— Laurie R. Godfrey (University of Massachusetts, Amherst), "The Paper Response to Scientific Creationism: What, Where, and When?"

— Suzanne K. Engler (University of Southern California), "ETs, Rafts, and Runestones: Confronting Pseudoarchaeology in the Classroom"

— Stephen Williams (Harvard University), "Fantastic Archaeology: How Should It Be Dealt With?"

Frank Harrold and Ray Eve are currently editing the collection of papers for publication. Anyone interested in obtaining more information should contact either of them or the individual authors.

—*Kenneth L. Feder*

See Harrold and Eve's related article in this issue.—ED.

UFOs and the Legacy of J. Allen Hynek

J. ALLEN HYNEK, the UFO movement's most prestigious spokesman, died of a malignant brain tumor on April 27. He was 75. But for the fact that Hynek opted to return to Ohio State University after World War II, not far from the USAF's Wright-Patterson Air Force Base in Dayton, Hynek would be remembered as an astronomer who played a key role in quickly constructing a network of Baker-Nunn cameras to track satellites in the late 1950s and later served as the head of the department of astronomy at Northwestern University.

When UFOs burst upon the scene in mid-1947, and the USAF's Foreign Technology Division at Wright-Patterson was given the responsibility for investigating UFO reports, they wisely decided that they needed a trained astronomer as a consultant, and Hynek's proximity at Ohio State led to his selection.

Initially, Hynek's skeptical view of UFOs coincided with that of the Air Force, and his name evoked harsh criticism from the "UFO-believers." The news media and members of Congress joined in the criticism in the mid-1960s when Hynek investigated a series of UFO sightings in Michigan and offered the explanation of "swamp gas." It was at about this time that Hynek's views on UFOs seemed to change. Shortly after the University of Colorado and Edward U. Condon were selected in the fall of 1966 to conduct an independent UFO investigation, Hynek "went public" in the December 17, 1966, *Saturday Evening Post* with moderate criticism of the USAF.

In December 1967, while the Colorado study was in progress, in an article published in *Playboy*, Hynek called for the creation of a UFO investigation center, with teams of investigators that could be quickly dispatched to the scene of a major UFO incident. If this were done and if UFOs were actually found to exist, Hynek predicted, "we would have photographs, movies, spectrograms, plaster casts of indentations (if a landing occurs) and detailed measurements and quantitative estimates of brightnesses, speeds, and so on within a year of the initiation of such a no-nonsense program. But if [this] program is sincerely and intensively carried out for a full year and yields nothing, this, in itself, would be of great negative significance. . . . I will be surprised if an intensive yearlong study yields nothing."

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Hynek (*left*) with Philip J. Klass at 1984 CSICOP Conference, Stanford University.

In 1969, following the negative findings of the University of Colorado study, the USAF decided to close out its UFO investigations, and Hynek's consulting contract was terminated.

In 1973, Hynek created the Center for UFO Studies (CUFOS), hired Allan Hendry as a full-time investigator, and arranged to supplement Hendry's efforts with those of dozens of field investigators affiliated with the Mutual UFO Network (MUFON). Although CUFOS investigated more than 1,300 UFO cases, it was never able to come up with any of the hard evidence that Hynek had forecast. If Hynek was discouraged over the results, he never revealed those feelings in his many public appearances.

Interviewed by Ian Ridpath in the May 17, 1973, *New Scientist*, as he was nearing the end of his career at Northwestern, Hynek spoke with remarkable

candor: "When I look back on my career, I've done damn little that was original. . . . I've never launched any new theories; I've never made any outstanding discoveries."

When Ridpath observed that Hynek "would be remembered not as an astronomer but as the man who made UFOs respectable," Hynek responded: "I wouldn't mind it, I wouldn't mind it. It's always nice to add one stone to the total structure of science. If I can succeed in making the study of UFOs scientifically respectable and do something constructive in it, then I would think that would be a real contribution." Hynek's obituary in the *New York Times* referred to him as an "astronomer and UFO consultant."

—*Philip J. Klass*

MacArthur Award to Randi

JAMES RANDI'S particular kind of genius has won him a MacArthur award.

Randi, probably the world's most active investigator of psychic claimants, was among 25 "outstandingly talented" people named July 14 to receive the 1986 MacArthur Fellowships from the John D. and Catherine T. MacArthur Foundation. The tax-free awards are intended to free the recipients from economic pressures for up to five years so they can devote themselves to their chosen endeavors.

Randi, magician, writer, lecturer, and investigator, is very well known to SKEPTICAL INQUIRER readers. He is a CSICOP Fellow (and one of its founders), a member of its executive council, a member of SKEPTICAL INQUIRER's editorial board, and a frequent author of investigative articles in *SI* and other publications.

The award money, he has indicated, will allow him to expand his investigations of those who claim paranormal powers.

Another MacArthur recipient this year is David N. Keightley, professor of history at Berkeley and a specialist on China's Bronze Age. He is the author of the evaluative article "Space Travel in Bronze Age China?" which appeared in *SI* in 1978 (vol. 3, no. 2).

—*K.F.*

MARTIN GARDNER

Notes of a Fringe-Watcher

The Unorthodox Conjectures of Tommy Gold

NO CLEAR LINE separates good science from bad; or, to put it more technically, no solution is known for what philosophers of science call the "demarcation problem" of finding sharp criteria for the ways good science should operate. This is hardly surprising, because all values have fuzzy boundaries. Who knows how to be sure when a novel is good or bad, or a painting, or a person, except at the extremities of spectrums? On the other hand, we couldn't talk at all if we didn't constantly make useful distinctions like day and night, even though twilight is ambiguous.

Sociologists who love to browbeat the scientific establishment for its rigid orthodoxy are seldom concerned with the speculations of those genuinely creative scientists who are often called "mavericks" because they delight in needling their peers with wild theories. Such a maverick is Thomas, or "Tommy," as he is known, Gold. His career is a thousand times more interesting and more significant than that of an irrelevant crank like Velikovsky. He is a distinguished scientist who may be—I stress the word *may*—on the threshold of triggering an authentic "paradigm shift" in geology.

Born in Vienna in 1920 and educated in England, Gold began his career as an engineer, designing radar equipment for the British Navy during World War II. In 1959 he bacame chairman of the Astronomy Department at Cornell University, where he is now a professor, and where he founded and for 20 years directed the Center for Radiophysics and Space Research.

No top scientist of recent decades has been less timid than Gold in publishing brilliant but highly unorthodox theories that range over many sciences. Unlike the dogmas of crackpots, Gold's conjectures are almost always based on vast amounts of hard data and a thorough knowledge of the relevant science. His theories are carefully reasoned, usually testable, published in orthodox journals, and strongly debated by other experts. Babe Ruth was famous for his home runs, but he also had unusually high numbers of strikeouts. Gold's record is similar. The price a maverick scientist pays for constantly tossing out bold theories is that most of them turn out to be wrong. But the hits can be spectacular.

It would take a book by someone

Cornell University

Maverick scientist Thomas Gold looms larger than life on "MacNeil-Lehrer Report."

better informed than I am about Gold's career to cover all of his speculations, so I must be content with sketching a few highlights. His biggest miss was the famous steady-state theory of the universe, developed in 1948 with Hermann Bondi and Fred Hoyle. In this theory, the universe did not have a big-bang origin. It has always been and always will be as it is now, expanding, with new matter forever being created in space to replace the matter that constantly flees outward. The theory collapsed with the discovery of background radiation from the primeval fireball, although, like Hoyle, Gold still thinks it may be revived someday in a more complex form.

Gold's biggest hit was his explanation of pulsars. When these strange stars, with their regular pulses of radio waves, were first discovered, Gold published in *Nature* his conjecture that they are extremely dense, fast-spinning neutron stars. Hardly anyone took this seriously. When the first conference on pulsars was held in 1968, Gold was refused platform time and had to air his views from the floor. Many scientists then found, and still find, his tone abrasive. Some still refuse to share a platform with him. Nevertheless, a few months after the conference Gold's predictions (that faster pulsars would be found and that their pulse rate would be slowing) were confirmed. Today, the standard explanation of pulsars is that they are rotating neutron stars.

Many of Gold's guesses have been half-right. A typical example was his much-publicized warning before the first moon-landing that the spacecraft might be swallowed by a thick layer of dust—"Gold dust," it was called. This didn't happen, but neither were astronomers right who expected the moon's crust to be solid rock. It is more like sand on a beach. The dust is there, just not nearly as deep or as powdery as Gold feared.

Almost every new satellite photograph

Cornell University

Gold in his Cornell lab.

of a planet or a moon starts Gold's mind buzzing with bizarre ideas. Most astronomers think the huge plumes erupting on Io, one of Jupiter's four giant moons, are active volcanoes. Not so, says Gold. Io's spinning in the mother planet's strong magnetic field generates enormous electric currents on Io's surface. They heat up spots that explode. This is probably another miss, but nobody really knows.

The most controversial, perhaps the most important, theory in Gold's career—it produced the cover article by David Osborne in the February 1986 *Atlantic*—is his theory that petroleum has a nonorganic form. This is an old theory, and one still held by some Soviet geologists, but in recent years Gold has revived and defended it with enormous energy and persuasiveness.

Conventional geological wisdom says that almost all the earth's old and natural gas is organic—"fossil fuels," they are called. Gold grants that *some* oil and gas is organic, but most of it, he is persuaded, comes from methane that formed when the earth was young and still slumbers deep beneath our planet's granite mantle. From these vast reservoirs it slowly seeps upward into sedimentary, fossil-bearing strata, where it gets trapped under the nonporous limestone domes into which oil and gas wells penetrate.

In Gold's opinion, earthquakes are partially caused by the pressure of this methane. It cracks the strata above, perhaps lubricating the faults. Escaping methane often catches fire and produces the lights in the sky so often reported during major quakes. Although methane is odorless to us, perhaps animals can smell it. If so, it could explain the widely reported strange behavior of animals preceding big quakes. It might also explain the booming sounds, the bubbling of gas in the ocean, and the deaths of fish. Gold first published his theory of the nonorganic origin of gas and oil in the February 1979 issue of the *Journal of Petroleum Geology*. *Scientific American* (June 1980) gave a more popular account of the theory, written by Gold and Steven Soter, who is also at Cornell.

In the years since, there have been mild confirmations of Gold's theory from the Soviet Union, where a deep hole was drilled into granite in the Kola peninsula, but the major test has just got under way in Sweden. About 360 million years ago, a huge meteorite crashed in central Sweden to form a crater that became Lake Siljan. This July the Swedish government began drilling 15,000 feet into this crater's bedrock, using a rig about 20 stories high. The cost is an estimated $20 million, and it may take several years to reach the required depth. The project is partly funded by the Gas Research Institute, a Chicago company whose president, Henry Linden, is a strong believer in Gold's theory. Indeed, he considers Gold a modern Copernicus.

Most geologists around the world think the theory is utter nonsense. One has likened it to the view that sugar-plum fairies cure cancer. "I am confident I'll be proved right," Gold said in an interview featured in *Omni* (December 1980).

My own guess is that the Swedish well will be dry, but that doesn't mean that scientists like Gold are not valuable to have around. In spite of his obvious

pleasure in ridiculing peers, he is always (unlike cranks) open to changing his views when evidence turns against them. If the Swedes do strike black Gold or methane in the crater's granite, it could alter history. Oil and gas will suddenly cease to be fossil fuels that are rapidly running out. Enormous reservoirs of oil and gas may be there deep below us, all over the earth, to supply cheap energy and cleaner air. In a few years we may know if Tommy Gold has struck out again or whether he has hit the longest home-run yet in his colorful career. •

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ROBERT SHEAFFER

Psychic Vibrations

NOW THAT WE'VE all survived Halley's Comet, it might be safe to review some of the effects it had, or was supposed to have had, on earth. *Plain Truth,* the magazine of Herbert W. Armstrong's Worldwide Church of God, had asked in a gaudy cover spread if Comet Halley was "a galactic omen." A whole host of eerie tales were recounted, including the comet allegedly foretelling attacks by the Huns and by Genghis Khan, the Turkish conquests in eastern Europe, and the death of King Edward VII. But the tables were quickly turned, and it proclaimed that the only reliable omens are those found in Scripture, and in any case only Armstrong knows how to interpret them.

Meanwhile, *The Examiner,* the weekly tabloid, quoted two supposed Japanese astrologers, who may or may not exist, saying that Halley's Comet would spark "an incredible baby boom." This was determined by studying ancient Chinese documents, which allegedly show a surge in the birthrate whenever the comet approaches. The comet was said to function like "a celestial Cupid's arrow"; Freudian interpretations of this suggestion are not given, but can easily be supplied.

Finally, readers of *Fate* magazine were given the unique opportunity to purchase "Halley's Comet Insurance," with certificates signed by Edmund Halley himself, such insurance perhaps being necessary "because you can never have enough." Readers of that publication were reminded that "this is the *first* and *only* time you'll be able to acquire this kind of cosmic coverage." The fine print, however, warns that "no claims will be paid," no doubt to forestall objections by zealous postal inspectors, but this probably did not seriously impede the issuance of policies.

* * * * *

While there are those who say that astrology is a sterile science, having made no progress over the past few millennia, the new "stress horoscope" developed by astrologer Kathleen Johnson shows them to be misguided and misinformed. Based upon information gathered by a major market-research firm in Australia, which shows which signs are intrinsically the most stressful, Johnson has gone on to derive a complete stress matrix of every sign related to every other, to enable us to determine, for example, whether a marriage between a Libra and a Pisces (placid!) would be more or less stressful than one, say, between a Gemini and a Virgo (trouble ahead!).

As reported in the *National Enquirer,* the most stressful signs are Aquarius, Gemini, Virgo, and Cancer, in that order, while the most tranquil are Pisces, Scorpio, and Taurus, also in that order. From

that data, Johnson compiled a matrix of interpersonal astrological stress. The most tranquil possible match is, of course, Pisces with Pisces, with a "stress index" of just 1. In fact, Pisces or Scorpio matched with any other sign yields a very low index of astrological stress, so laid-back are these people, making them the astrological analogue of a universal blood donor, capable of bestowing tranquility upon any union. The most dangerous possible match is, of course, Aquarius with Aquarius, yielding a stress index of 78. Such marriages would seem certain to end in strife, if not manslaughter, although Aquarius, Gemini, or Virgo matched with *any* other sign except Taurus, Scorpio, or Pisces generates stress in unhealthy doses, making people born under those first three signs virtual walking astrological time-bombs, poised to spread extreme stress and mayhem to all they meet. If you are among those unfortunates born under one of the signs of high stress, remember that the stars incline, but do not compel, and that when your temper gets you into serious trouble, as it eventually will, you may be able to convince the court to consider your astrological sign as a mitigating circumstance. If not, better luck next life. •

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Special Report

Exposing the Faith-Healers

Robert A. Steiner

> My grandfather was a minister. When my grandmother was diagnosed as being a diabetic, they turned to faith healers. They attended all sorts of revivals, hoping to cure her illness. Thinking she had been cured, she consumed [foods her doctors had advised against], which eventually killed her. She died on my birthday.
>
> —Name withheld by request

A VISIT BY James Randi is always interesting and exciting. This past February we pulled out all the stops. He would be staying with me at my Bay Area home for more than a week.

I had scheduled an appearance on a radio talk-show. The following day he gave a talk for the general public on "The Joys and Perils of Psychic Investigation." And the day after that, in a lecture for magicians, Randi explained some new techniques—to be used for entertainment purposes only.

The big news was that Randi was investigating faith-healers. On February 23, we would be attending the Peter Popoff Crusade in San Francisco. Randi had discovered Popoff's methods, but he needed proof.

He requested that I round up a number of trusted people. We would go to Popoff's presentation in an attempt to gain further information and have one of our people chosen for a "healing." To obtain proof, beyond a reasonable doubt, would be a monumental job. To have one of our few people chosen from among the more than 1,000 who would attend was a long shot. I accepted the assignment and got to work.

On that Sunday morning, 25 people convened at my house. These trusted, dedicated individuals were enlisted from the Bay Area Skeptics and the Society of American Magicians. After a briefing by Randi, we were on our way to the Civic Auditorium in San Francisco, where the Reverend Popoff

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Robert Steiner is founder and past chair of the Bay Area Skeptics, a professional magician, a lecturer, chairman of the National Occult Investigation Committee of the Society of American Magicians, and a certified public accountant. He is a CSICOP Fellow. *This is an expanded version of an article that originally appeared in the Summer 1986* Free Inquiry *magazine, a special issue on faith-healing.*

would present his "crusade." We arrived early, in order to observe, set up, and attempt to be accepted for healings.

While the others in our group were finding strategic places in the auditorium, I joined Alexander Jason, an electronics expert. Alec had brought with him $20,000 worth of equipment and a million dollars worth of knowledge and experience. He and I set up a table in the hall on the second floor, behind the balcony of the auditorium. As people passed by, they saw Alec wearing headphones as I listened intently to an earphone plugged in my ear. We tried to keep the scanners, tape recorders, aerials, and other equipment under cover.

There we sat, listening, scanning, searching, and adjusting. While Alec worked with the equipment, I kept a watchful eye for anyone who might interfere. The time dragged. Now the service inside the auditorium was about to start; we had searched for more than an hour, and we still hadn't found what we were looking for.

Then Alec got excited. He literally jumped out of his seat and then gave me the thumbs-up sign. What he had tuned into, and what we have on tape (and what was subsequently revealed by Randi nationwide on Johnny Carson's "Tonight" show) was a behind-the-scenes broadcast from Elizabeth Popoff to her husband. It began: "Hello Petey. I love you. I'm talking to you. Can you hear me? If you can't, you're in trouble."

Randi had told us about his discovery that Popoff wears a "hearing aid" inside his ear. He had gathered enough circumstantial evidence to surmise that someone was broadcasting the information for the "healings" to Popoff. Our assignment was to obtain the absolute documentation, the hard evidence, the proof. And here it was: the secret method by which the Reverend Peter Popoff obtains the information he disseminates to the assembled folks as coming from God.

Mrs. Popoff became very businesslike as she continued: "I'm looking up the names right now."

The information for Popoff's so-called healings among the audience came from secret radio transmissions from Elizabeth Popoff backstage. She obtained the information from "prayer cards" filled out by the attendees, as well as from her conversations with those present before the start of the formal proceedings. The Reverend Popoff then reveals the information to the assembled crowd as divine messages from God.

The following example of a healing was taken from our tape of the Popoff Crusade a few weeks later in Anaheim, California, on March 16, 1986.

Peter Popoff calls out: "Virgil. Is it Jorgenson? Who is Virgil?"

After a man in the audience identified himself as Jorgenson, Popoff continued: "Are you ready for God to overhaul those knees?"

The spectator appeared to be in his sixties and walked with a cane. When he reacted to Popoff's "healing," Popoff went on: "Oh, glory to God. I'll tell you, God's going to touch that sister of yours all the way over in Sweden."

Popoff then took the spectator's cane and broke it over his (Popoff's) knee. The spectator walked about the auditorium, praising Popoff and God.

Now let's look behind the scenes. With the benefit of our electronics technology, we hear the entire conversation.

Elizabeth Popoff transmits to Peter Popoff: "Virgil Jorgenson. Virgil."

Peter Popoff calls out: "Virgil."

Elizabeth: "Jorgenson."

Peter (inquiringly): "Is it Jorgenson?"

Elizabeth: "Way back in the back somewhere. Arthritis in knees. He's got a cane."

Peter: "Who is Virgil?"

Elizabeth: "He's got a cane."

Peter: "Are you ready for God to overhaul those knees?"

Elizabeth: "He's got arthritis. He's praying for his sister in Sweden, too."

Peter: "Oh, glory to God. I'll tell you, God's going to touch that sister of yours all the way over in Sweden."

There are many more such conversations on our tapes.

So impressive was the "healing" of Virgil Jorgenson that Peter Popoff used the film clip for three consecutive weeks on his television show.

Popoff assures the folks forcefully and often that his information comes directly from God. As a matter of fact, he even claims to have visited Heaven for some weeks and to have personally spoken to God.

An important part of our investigation in San Francisco was to obtain proof not only that Popoff's claimed method of obtaining information was false, but also that the information itself is sometimes false. This would strengthen our case in proving that the information does not, as claimed, come from God. Enter Don Henvick.

Don Henvick is program coordinator for Bay Area Skeptics and president of Assembly #70 of the Society of American Magicians.

From the thousand-plus people assembled in the San Francisco Civic Auditorium, "Tom Hendrys" was one of only about fifteen persons selected for healing. Hendrys, who was "healed" of nonexistent alcoholism, was in reality Don Henvick. "Marty Post" was also healed; he is Ivars Lauersons, another Bay Area Skeptics activist.

Weeks later, while we were waiting at the airport for a flight to Anaheim to attend Popoff's presentation there, Alec pointed to a gentleman who appeared to be in his sixties. He inquired, "Bob, do you recognize that man?"

I replied I did not.

Alec pursued the matter: "Wasn't he at the Popoff Crusade a few weeks ago?"

"I don't know," I responded. "There were more than a thousand people there."

The "stranger" was Don Henvick. He had shaved off his beard, his moustache, and most of the hair on his head and had colored his remaining hair gray. He limped around with a cane. Since he had been healed in San

Francisco by Peter Popoff, Don had added several decades to his appearance, as well as having acquired a severe problem with walking. It was this superb skill in out-conning the con artist and his wonderful acting ability that got Don "Virgil Jorgenson" Henvick shown on the televised Popoff show for three weeks running. He was now on his way to be "healed" again.

We investigated other faith-healers as well. This report has focused on one of them to give the flavor of such performances. While they differ in style and method, the concept is always the same. They claim miraculous knowledge from God and that God works through them to do miraculous healings.

The Reverend David Paul healed Don "Tom Hendrys" Henvick of nonexistent alcoholism in Stockton, California. W. V. Grant healed Don "Abel McMinn" Henvick of a nonexistent prostate condition and nonexistent arthritis in Philadelphia. And Peter Popoff healed Don "Bernice Manicoff" Henvick in Detroit. Yup, adorned in woman's garb and seated in a wheelchair, Don Henvick was "healed" of uterine cancer by Popoff. (Need I point out that Don does not have uterine cancer?)

The television show "A. M. San Francisco" (Channel 7, KGO-TV), contacted me the day before faith-healer "Amazing Grace" was to appear on the show. All the advance promotion was about Grace. The format called first for an interview with Grace. The second segment was to consist of healings by Grace. I was to come out in the third segment and, in her presence, attempt to discredit the entire thing.

Advice from friends was not to go. The deck was stacked. The audience would be packed with true believers and Grace's followers. With her exclusive appearance in the first two segments, I had to lose, they said.

But they did not know about my secret weapon.

When I first came out, I asked for and received clear assurance from Grace that she had the Gift of Knowledge, that her information came directly from God, and that God never makes a mistake.

I then produced my secret weapon. The first person she had chosen to "heal" was (Are you ready?) Don Henvick. By exposing the fact that Grace healed him under an assumed name of a nonexistent ailment, I was able to show that her claim was false, that her information does not come from God.

The "faith-healers" uniformly claim or imply that their information comes from God and that the "healings" are done by God and Jesus, working through them. Yet we know for a fact that the information comes from data supplied by the attendees. Furthermore, several of the faith-healers have called out some persons using false names, identified disease symptoms that did not exist, and cured them of these nonexistent diseases. Clearly such false information could not have come from God or Jesus. Neither of them would make such elementary mistakes. The representations to the public are false. The "faith-healers" have knowledge that they are false. They do it for the purpose of obtaining money.

This is not religion. This is not protected by the First Amendment to the Constitution of the United States. This is a con game. •

Was Antarctica Mapped by the Ancients?

Suggestions that Antarctica was mapped in ancient times by an unknown civilization are speculative. Evidence said to support ancient mapping has mundane explanations.

David C. Jolly

EVERY SO OFTEN, it is suggested that Antarctica was mapped in very ancient times by an unknown civilization. The first antarctic landfall is generally considered to have been in 1820, and actual mapping did not occur until later. However, many sixteenth-century maps show a continent at the present location of Antarctica (Figures 1 and 2). To some eyes these depictions resembled the present shape of that continent minus the shelves of ice along its coast. This would imply that the mapping was done either at a time when the ice was much reduced, or perhaps through the ice using sophisticated scientific equipment. These depictions began to disappear from maps during the seventeenth century, and the South Pole region was usually left completely blank until the nineteenth century.

The major advocate of ancient mapping was the late Charles Hapgood.[1] Later writers of the von Däniken-Berlitz school have suggested that this mapping was done by space aliens.[2,3] Speculations about ancient mapping of Antarctica were given a boost in 1984 by an article in the *New York Times* that approvingly described a work that had just been published by John Weihaupt,[4,5] a geologist at the University of Colorado at Denver. He had concluded that modern geophysical evidence shows that the coastline of Antarctica several thousand years ago would have resembled maps of Antarctica printed during the sixteenth century.

I know of no historian of cartography who adheres to any of these ancient mapping theories. One told me these theories are "goofy." Nevertheless, these ideas have received considerable attention in the popular press;

David Jolly (P.O. Box 931, Brookline, MA 02146) publishes an annual handbook for the rare map trade.

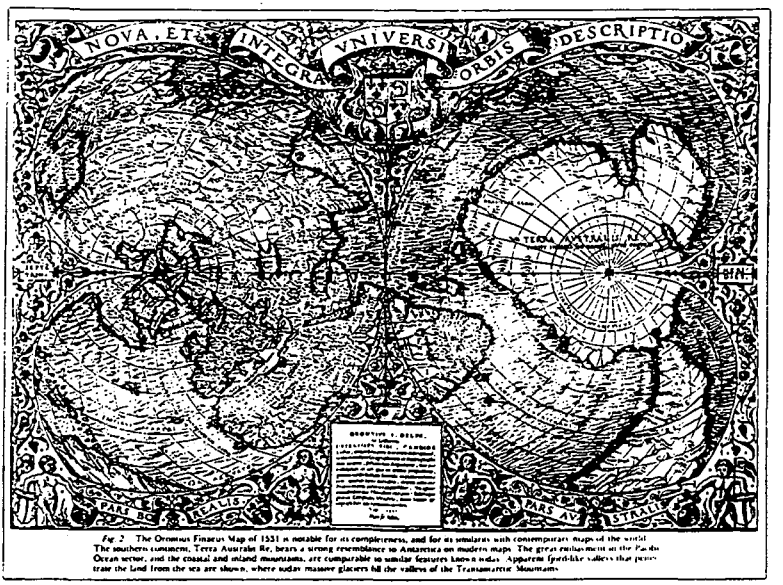

FIGURE 1. The beautiful Orontius Finaeus woodcut world-map of 1531 is often cited as proof of the ancient mapping of Antarctica.

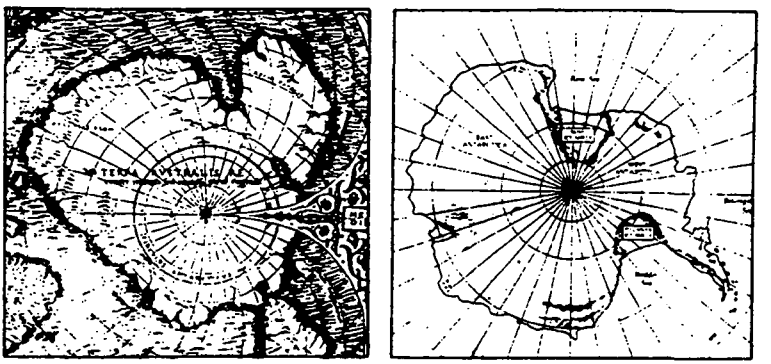

FIGURE 2. Antarctica is in the eye of the beholder. Do these two maps show the same thing? Note that the Finaeus map (*left*) would be much larger than the modern map (*right*) if the scales were equal.

and, since the "experts" have been wrong before, it might be worthwhile to review some of the evidence.

Maps of the Ancient Sea Kings

Ancient mapping's best-known proponent, Charles Hapgood (1904–1982), received his B.A. (1930) and M.A. (1933) from Harvard and did wartime service in the Office of Strategic Services. He taught at a number of schools,

including the Putney School in Vermont, Keystone Junior College in Laplume, Pennsylvania, and Keene State College in New Hampshire.[6] He is widely known for writing about unconventional ideas in geography and geophysics and has become something of a folk-hero to those unhappy with conventional science. In *Earth's Shifting Crust* and in its revised edition, *The Path of the Pole*,[7,8] he argued that the ice ages are an artifact of rigid slippage of the earth's crust. Albert Einstein supplied a foreword to this work and appeared to take a courteous and relatively favorable attitude toward Hapgood's work without explicitly endorsing it. Another Hapgood book dealt with spiritualism.[9]

His most influential work was undoubtedly *Maps of the Ancient Sea Kings*. Hapgood did a good deal of original research in developing his thesis, and his book should not be confused with pulp-fare about Mu, Lemuria, and Atlantis. Although I found the book quite entertaining, the lengthy discussions of map projections would certainly bore anyone seeking lurid tales of lost continents. Hapgood considered himself a serious investigator and was not trying to pander to mass gullibiligy. In the best scholarly tradition, he generously acknowledged the students who helped him and credited Captain Arlington H. Mallery for first suggesting the ancient-mapping idea.

Much of Hapgood's work was based on the Piri Re'is map, a hand-drawn Turkish map done in 1513. Only the Atlantic section survives. One note on the map states that it was compiled from "about twenty charts and Mappae Mundi—these are charts drawn in the days of Alexander, Lord of the Two Horns, which show the inhabited quarter of the world . . . and from the maps just drawn by four Portuguese which show the countries of Hind, Sind and China . . . and also from a map drawn by Colombo in the western region I have extracted it [*sic*]."[10] The map was discovered in Istanbul in 1929, and is now regarded as a priceless document preserving in copied form a map of Columbus.[11]

Piri Re'is chose his sources well. Interpreting his remarks, he used ancient Greek maps showing the "inhabited quarter," presumably meaning the area surrounding the Mediterranean. There is nothing mysterious about this. In the early sixteenth century, maps attributed to Claudius Ptolemy of Alexandria depicting that region were widely available. They were issued in Europe in many printed editions beginning about 1478, and these or similar maps are probably what Piri Re'is was referring to. For the East Indies ("Hind, Sind and China"), he used charts captured from the Portuguese, who at the time were actively exploring that area. For America, he used a map of Columbus that had fallen into Turkish hands. Another note informs us that he reduced all his source maps to a common scale and combined them to form one chart.

What then is the mystery? Hapgood convinced himself that a portion of the South American coast was really a misplaced section of Antarctica, shown without ice. He claimed to have identified a number of present antarctic features, such as bays and peninsulas, along this portion of coast. Perhaps so,

but it is not difficult to find correspondences between two jagged coastlines. If Hapgood intended to turn the world of ancient maps on its ear, he failed. Dr. Helen Wallis, now curator of maps at the British Library, called the book enjoyable to read, questioned Hapgood's assumptions, and praised the illustrations.[12] Mr. Hapgood died in Fitchburg, Massachusetts, in December 1982 at the age of 78, after being struck by a car while crossing the street. At the time of his death, he was said to be working on a revision of *The Path of the Pole.*

To gauge his influence on mainstream science, I scanned *Science Citation Index* from 1961 through 1983 for references to Hapgood. I found eight works citing Hapgood. One was a popular article, one a book review, two were unrefereed comments or letters, and the remaining four made passing references to Hapgood, mostly of the "some even claim" variety. He may not have revolutionized science, but he did live to be almost 80, had fun doing it, and wrote an entertaining book or two. Many of us would settle for as much.

Problems with the Ancient-Mapping Theory

Hapgood's work ranges over the sources of our Western cartographic tradition, projection methods, and a number of fascinating side issues. I will focus here on whether Antarctica was mapped in ancient times. That phase of Hapgood's work has gained what some might view as academic respectability with the publication of Weihaupt's paper in *EOS,* and it figures prominently in ancient-astronaut speculations. I would like to present the more conventional view, what some might refer to as "the orthodox handout."

Much of the cartographic evidence used to support the ancient-mapping theory consists of a series of printed maps published beginning in the early sixteenth-century. These include the 1531 map of Orontius Finaeus,[13] a 1538 derivative of that map by Mercator,[14] and a number of later maps, all depicting a southern continent. These depictions probably have their roots in ancient and medieval times, when it was widely believed for various theoretical reasons (such as north-south symmetry) that a southern continent must exist. Among authorities professing such a belief were Aristotle, Eratosthanes, Macrobius, Albertus Magnus, and Roger Bacon.[15] One conventional view is that Finaeus and others simply placed an amorphous blob at the South Pole to conform to this widespread belief. This is not contradicted by evidence on the Finaeus map itself. Three legends appear on the continent. One is a misplaced reference to Brazil, a land already discovered by Cabral. A second legend, *Regio Patalis,* is a name taken from Pliny the Elder, who describes an island of that name in the Indian Ocean, but at a different location.[16] The third legend calls the continent "recently discovered but not yet completely known," perhaps referring to the voyage of Magellan. These inscriptions hardly make a case for ancient documentary sources in the hands of Finaeus. On the contrary, they suggest the use of well-known sources.

Magellan navigated the strait bearing his name in 1520. Within the frame-

work of a theoretical belief in a southern continent, it made sense for geographers to assume that he had navigated a narrow strait between America and the suspected continent. The connection of Magellan's discovery and *Terra Australis* is indicated on many maps. For example, on a 1587 world-map by Mercator,[17] there is a legend on *Terra Australis* stating in plain Latin, *Hanc continentem Australem nonnulli Magellanicam regionem ab ejus inventore noncupant* (Some people call this southern continent the Magellanic region after its discoverer). There is no indication in this legend that Mercator possessed secret information about any earlier discovery which he used to draw his 1538 map. In addition, the outline of *Terra Australis* on the 1587 map does not conform to that on the 1538 map. Clearly Mercator did not consider his 1538 map or the Finaeus map to be reliable.

It is possible that geographers simply drew an amorphous mass of land around the South Pole with the single determined point being the Straits of Magellan. A good example of such an extrapolation of a single observation is Weihaupt's Figure 1.[18] The necking of North America to a narrow isthmus on the eastern seaboard was the result of Verrazzano's 1524 sighting of water on the landward side of the islands off the North Carolina coast. He assumed that Pamlico Sound was an inlet of the Pacific Ocean. Verrazzano was unable to return for further exploration because the fierce Carib Indians ate him, and the nonexistent isthmus persisted for some time on maps of the period.[19]

In the early seventeenth century, doubts developed about the reality of the southern continent. A quaint précis of thinking at this time appears on a very rare map by William Grent: "This South land undiscovered commonly knowne by the name of Terra Australis incognita or Magellanica cannot certainly be affirmed either continent or Islands[.] Only some few coasts thereof have appeared to Sea men driven thereupon by extremity of weather whose names are set downe. The rest must remaine clouded in obscuritie till future times and Further discoveries produce them to light."[20] These were wise words, and as the seventeenth century rolled on *Terra Australis* began to disappear from maps.

Several pre-Magellan maps contain hints of an antarctic land mass. The Roselli world map of circa 1508 shows an east-west coastline about 15° south of the Cape of Good Hope.[21] A 1515 globe by Johannes Schöner shows a south-polar land mass in the shape of a ring.[22] The central sea is accessible through a strait communicating to the South Pacific Ocean. It is known that Magellan had access to a chart that showed a strait connecting the Atlantic and Pacific, and therefore also showing a southern land-mass.[23, 24] This chart, now lost, perhaps resembled the Schöner depiction. Other examples could be cited. However, surviving pre-Magellan depictions of an antarctic continent do not resemble its present shape, and plausible sources for most of these depictions have been suggested.[25]

Hapgood operated by concatenating unproven assumptions. He admitted that the Finaeus depiction of Antarctica is too large but *assumed* that Finaeus

misinterpreted his ancient source. This is convenient, since he was now able to explain the absence of the long Antarctic Peninsula by *assuming* that Finaeus omitted it because it would have bumped into Cape Horn. He admitted that the Finaeus depiction more closely resembles Antarctica if it is rotated by 20° and *assumed* that Finaeus had done this. Where an old map seemed to him to correspond to a modern feature, he credited ancient wisdom; but, if there seemed to be differences, then the sixteenth-century mapmaker must have misinterpreted his sources or made a copying error. It is an approach that makes his hypothesis unfalsifiable since all contrary evidence is easily discarded.

Hapgood's book contains numerous errors and many assumptions of an ad hoc nature. Some of his assumptions may seem plausible at first glance, but he generally invoked unlikely explanations where much simpler ones would suffice. For example, on page 176, he noted that a 1487 Mediterranean chart showed a bay at the mouth of the Guadalquivir River in Spain. He claimed that this represented the river as it was before sediment had accumulated at its mouth, i.e., thousands of years ago. However, when I compared the map with a modern map, it was clear that the 1487 mapmaker had exaggerated all promontories, inlets, small islands, and so on, to make them more visible to the user. This is not an unusual cartographic convention. On pages 176–177 he showed the 1487 depiction of the Aegean alongside a modern map (Figures 97 and 98). He noted that the islands on the old map are larger and concluded that the sea level was lower when the presumably ancient source-map for the 1487 map was surveyed. My previous comment on exaggerating small features explains that. He also noted that the old map showed many more islands than the modern map, implying a much lower sea-level when the original map was done. This would indeed be a mystery, but when I consulted my household atlas I found that his modern map mysteriously omits numerous islands.[26] In fact, the 1487 map resembled my atlas more closely than did Hapgood's modern map. Hapgood supporters are invited to take this "map comparison test." The only mystery is where Hapgood obtained such a bad modern map of the Aegean. Such carelessness does not inspire confidence. I do not think that Hapgood was intellectually dishonest—merely that he uncritically accepted any evidence supporting his views and did not try very hard to come up with alternative explanations. Ultimately, he became a victim of his own enthusiasm.

There may remain for some a vague feeling that the depiction of *Terra Australis* on the Finaeus map bears a superficial resemblance to modern Antarctica, or that it seems too definite in shape to have been invented from whole cloth. On a speculative basis, it is possible to suggest a source he may have employed. Wieser[27] discussed a broadside publication, *Zeytung auss Pressilg Landt,* dating from about 1515, which describes a voyage to southern latitudes, and suggested that Schöner used this as a source for depiction of the southern continent on his globe of 1520.[28] The broadside seems to liken the coastline of part of the southern continent to northwestern Africa, and

Wieser claimed to recognize features on the globe's depiction of Antarctica resembling the Gulf of Sidra and the Gulf of Guinea, although the entire southern continent on the globe does not resemble Africa. He also suggested that otherwise mysterious identification of *Terra Australis* with Brazil derives from this same source.

The *Zeytung* appeared in several editions, suggesting widespread circulation, and it does not strain credulity that Finaeus had seen a copy. The *Zeytung* is not easily understood. An exasperated Wieser branded it a grammatical labyrinth.[29] It is not inconceivable that the Frenchman Finaeus misunderstood or incautiously extrapolated the reference to Africa, and simply transplanted a second African continent at the South Pole! To my eye, the shape and size of *Terra Australis* resemble early depictions of Africa more than modern Antarctica.

Another hypothesis has been advanced by Enterline.[30] He suggested the Finaeus map may be based in part on actual discoveries in the early sixteenth century for which we now have no detailed account. For example, the large indentation on the Pacific coast of *Terra Australis* (which Weihaupt believes represents the Ross Sea) may represent early reports of Australia's Gulf of Carpenteria. Thus the Finaeus map may be a blend of imagination and fact. Enterline's thesis, while ingenious, still depends on making assumptions that cannot be proved. However, he presented a plausible sequence of events that could easily be true.

The simplest theory is that Finaeus drew an asymmetrical, bi-lobate blob of no special shape to conform to ancient belief in a southern continent and to Magellan's discovery. The blob-theory is consistent with the varying shape of *Terra Australis* on maps both before and after the Finaeus map. If there were actual observations or maps of the coastline, one would expect a more consistent representation.

Clearly there are plenty of prosaic ideas about how Finaeus might have drawn his map. All have some factual components, while there is no evidence whatever of ancient sources for the shape of the coastline. One cannot rule out ancient sources, but why postulate something for which there is no evidence to explain that which needs no explanation?

Weihaupt's Contribution

When I first saw Weihaupt's paper, I assumed he was attempting to update Hapgood's work and was surprised to find no mention whatever of Hapgood. The aforementioned *New York Times* article and several other commentators on Weihaupt's work have noted this omission.[31-33] However, Weihaupt arrived at his hypothesis by an independent route.[34] In addition to the mapping evidence, Weihaupt discussed some geophysical evidence. As I understand it, he contends that during the Hypsithermal Interval (from about 7,000 to 500 B.C.) the Ross ice shelf was greatly diminished. This would, in his view, cause the outline of Antarctica to more closely resemble the Finaeus depiction.

To support this contention, he cited observational evidence, along with some theoretical models. In a reply to Weihaupt, Louis Lliboutry hotly disputed Weihaupt's conclusions about the ice sheet.[35] Lliboutry, president of the International Commission on Ice and Snow, cited evidence that the ice shelf has not changed significantly over the time span considered by Weihaupt. Lliboutry concluded, "It seems that, in spite of some hard facts and in spite of warnings against simplistic theories, the idea of fast changes in the Ross Ice Shelf and in its main nourishment area, Marie Byrd Land, is widespread in the United States." Such strong language suggests he may have an ax of his own to grind. Worse, Lliboutry also presented his own view of how sixteenth-century cartographers arrived at their depiction of Antarctica as established fact. In his reply, Weihaupt properly chided Lliboutry for the latter, and presented additional evidence to rebut Lliboutry's geophysical assertions.[36] Apparently at our present state of knowledge, one can select evidence to either support or refute the occurrence of recent changes in the ice shelf.

Weihaupt attempted to bolster his case with cartographic evidence, but his choice of maps was unfortunate. He cited a map of Mercator, but failed to point out that Mercator also published a map of the *north* polar regions that shows a fictitious *north-polar* continent.[37] This nonexistent land is furnished with rivers, well-defined river deltas, mountains, and a sharp coastline with numerous small bays. An inset shows the mythical arctic island of Frisland, complete with named cities! Obviously, a definite-appearing coastline does not imply reality. A claim by Weihaupt that the Finaeus map shows "fjord-like depressions" and the Transantarctic Mountains must be viewed in this context. Mercator was not reluctant to include hypothetical lands on his maps for theoretical reasons or on the basis of legends or flimsy explorers' reports. Since he was one of the more scientific early cartographers, one shudders at the reliability of maps by his contemporaries. Weihaupt's Figure 2 shows a 1540 map of America by Sebastian Münster.[38] In the caption Weihaupt identified a partly visible land-mass south of the Straits of Magellan as a "southern continent." However, the world map from the same atlas clearly shows this to be a large island off the tip of South America, and no polar continent whatever is shown.[39] Weihaupt also cited a map by the notorious charlatan Philippe Buache. Figure 3 shows another map by him in which an entirely imaginary sea occupies the American Northwest.[40, 41] Even in the middle of the eighteenth century, two centuries after Mercator, imaginary features were freely added to maps to make theoretical points.

In a curious slip, Weihaupt employed the name *Terra Australis Re* throughout his article. This is a meaningless phrase mistakenly derived from the legend *"TERRA AUSTRALIS REcenter inventa, sed nondu[m] plene cognita"* (southern land recently discovered but not yet completely known). The *RE* is part of the hyphenated word *REcenter*, as can be seen in Figure 1. This suggests he may not have read the entire inscription, whose words by themselves almost refute his case.

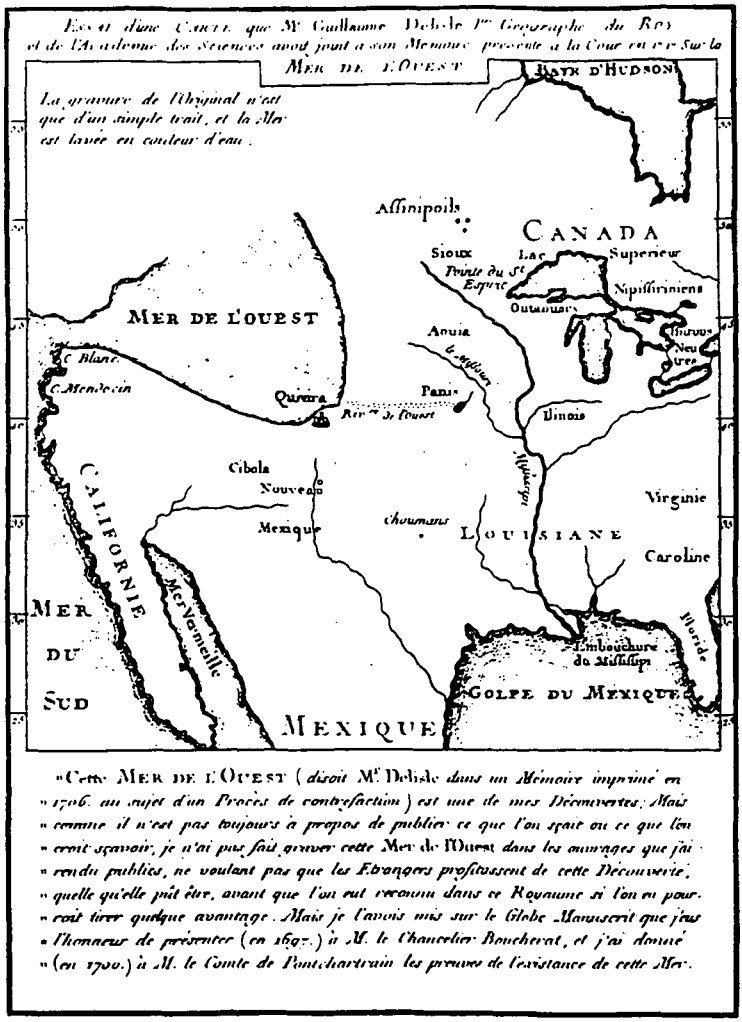
Extrait d'une Carte que Mr Guillaume Delisle Ier Geographe du Roy et de l'Academie des Sciences avoit joint a son Memoire presenté a la Cour en 1717 Sur la
Mer de l'Ouest
Baye d'Hudson
La gravure de l'Original n'est que d'un simple trait, et la Mer est lavée en couleur d'eau.
Assinipoils
Canada
Sioux
Lac Superieur
Pointe du St Esprit
Nipissiriniens
Outaouacs
Hurons
Neutres
Mer de l'Ouest
Anuia
Lac des Illinois
C. Blanc
C. Mendocin
Quivera
Panis
Riv.re de l'Ouest
Illinois
Cibola
Nouveau
Mexique
Choumans
Louisiane
Virginie
Caroline
Californie
Mer du Sud
Mer Vermeille
Embouchure du Mississipi
Golfe du Mexique
Floride
Mexique
"Cette Mer de l'Ouest (disoit Mr Delisle dans un Memoire imprimé en
"1706. au sujet d'un Procés de contrefaction) est une de mes Découvertes. Mais
"comme il n'est pas toujours à propos de publier ce que l'on sçait ou ce que l'on
"croit sçavoir, je n'ai pas fait graver cette Mer de l'Ouest dans les ouvrages que j'ai
"rendu publics, ne voulant pas que les Etrangers profitassent de cette Découverte,
"quelle qu'elle pût être, avant que l'on eut reconnu dans ce Royaume si l'on en pour-
"roit tirer quelque avantage. Mais je l'avois mis sur le Globe Manuscrit que j'eus
"l'honneur de présenter (en 1697.) à M. le Chancelier Boucherat, et j'ai donné
"(en 1700.) à M. le Comte de Pontchartrain les preuves de l'existance de cette Mer.

FIGURE 3. A map published by the French cartographer Philippe Buache in 1753 to give credence to his geographical theories. To enhance the map's credibility, Buache falsely attributed it to his deceased father-in-law, the famous cartographer Guillaume de l'Isle. With unintentional irony, Buache showed his mythical Mer de l'Ouest washing the shores of the fabled and equally non-existent kingdoms of Quivira and Cibola. The only kind comment one can make about this map is that few copies have survived. Since this particular map was done in an age of scientific cartography, and two centuries after the early maps showing an antarctic continent, it is clear that caution must be used in interpreting those earlier maps. Both Hapgood and Weihaupt cite a Buache map of Antarctica as supporting ancient mapping. Is it any more reliable than this map?

It must always be kept in mind that old maps often show lands of myth and legend, such as St. Brendan's Island in the Atlantic and the large lake

in South America on which was located the fabulous city of El Dorado. California was frequently depicted as an island, and the North Pacific was filled with strange land-masses. Many of these misconceptions persisted well into the eighteenth century. These nonexistent lands are often shown with detailed mountains, bays, rivers, cities, and so on.

Anyone interested in pursuing early mapping theories should first read *Maps of the Ancient Sea Kings,* followed by *The Mapping of the World,*[42] a compendium of early world maps that shows how the conception of the southern continent changed over the centuries. Nordenskiold's *Facsimile-Atlas to the Early History of Cartography*[43] and Bagrow and Skelton's *History of Cartography*[44] also provide helpful overviews. Enterline's paper[45] and Wieser's monograph[46] give scholarly information specifically related to Antarctica. The recently published *Sea Charts of the Early Explorers*[47] illustrates numerous charts dating back to 1290. This work shows that the so-called portolan charts of the Mediterranean evolved from crude prototypes and were not derived from ancient sources as Hapgood claimed. Cortasão's treatise[48] discusses the methods of early chartmakers. O. A. W. Dilke's *Greek and Roman Maps*[49] provides a recent scholarly summary of cartography in classical times. One illustration of particular interest shows the so-called Farnese Atlas, a Roman copy of an earlier Greek statue of Atlas holding a celestial sphere on his shoulders. Dilke notes that "there are no constellations in the antarctic areas, invisible from the Mediterranean," implying that southern navigation was little known or unknown then. For those with more eclectic tastes, two scientific articles mention Hapgood's polar-wandering theory in passing.[50, 51]

Conclusion

Our knowledge of early cartography is limited, since much material from the sixteenth century is now lost. While this affords ample opportunity for speculation, there have been many scholarly studies of this period. These studies were not done by dunces, but by individuals who spent years acquiring the skills and perspective necessary to interpret the evidence. Professor Hapgood, to his credit, spent almost ten years studying the evidence and consulting experts in the field. His ideas were rejected in scholarly circles not because of animus but because he had not proved his case. Too many leaps of faith were needed to establish his thesis. I fear it is impossible to be equally charitable toward some later advocates of the Hapgood thesis, whose methods do little credit to his memory.

Hapgood was the quintessential enthusiastic amateur. In *Maps of the Ancient Sea Kings* he quotes Edison as saying that a certain problem was too difficult for the experts—it would be necessary to wait for some amateur to solve it. Hapgood felt that nonexperts were free of bias and could make advances in areas where experts were baffled. The world needs a few Hapgoods to make life interesting, but we should expect more from those with

scholarly training.

I encourage anyone interested in ancient-mapping theories to consult the references provided in the Notes below and form their own conclusions. Early cartography is a fascinating field of research. Within my own experience, fresh ideas, supported by evidence, have always been welcomed.

Acknowledgment

Dr. Robert Karrow, Jr., curator of maps at the Newberry Library, called my attention to Enteriine's paper, and Gail Ivey, of the Massachusetts Institute of Technology, provided translation assistance.

Notes

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34. In a telephone conversation (May 22, 1985) Dr. Weihaupt explained that in connection with his interest in the evolution of antarctic ice he had asked the Library of Congress to provide him with early maps of Antarctica. His inspection of this material suggested to him that the earliest maps may have been surveyed at a time when much less ice was present. He was unaware of Hapgood's work when preparing his paper.

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36. J. G. Weihaupt, Reply to Milton and Lliboutry, *EOS, Trans. Amer. Geophys. Union*, 1226-1227 (Dec. 18, 1984).

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38. S. Münster, [Map of America having variant titles] Basle, 1540 and succeeding years.

39. S. Münster, *Typus Orbis Universalis* (Basle, 1540). (Illustrated in Shirley, Plate 67.)

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Folk Remedies and Human Belief-Systems

How body and mind work together to make folk remedies seem successful.

Frank Reuter

> My oldest brother had a toothache, and a man told us: You know them places that be on the inside of a mule's leg looks like it been a sore or something. He told us to get a pocket knife and trim some of that off and put it in a pipe and let my brother smoke it. And we did that and it stopped it.
>
> Folk informant, Dermott, Arkansas, 1976

THE USE OF the "chestnuts" on the inside of a mule's leg to cure toothache may not be a very widespread practice, but it is a small part of what is historically the world's most extensive system of medicine: the folk remedy. Medical science as we know it is rather new. The knowledge that microorganisms exist and play a role in disease is little more than a century old. For most of history, folk remedies were mankind's defense against disease and pain. In large parts of the world, folk medical practices still predominate, and remnants of them can readily be found in the midst of our technological culture.

If the toothache remedy seems silly on first reading, it is probably because most of us seek out dentists to treat our cavities. You might ask yourself what you would do were you equipped with a pipe, a knife, and the remedy in the opening quotation, but no pain relievers or other known remedies, and you experienced an excruciatingly painful toothache while traveling in a remote area by mule. The efficacy of the remedy is guaranteed by the folk practitioner, who bluntly proclaimed that the aching "stopped."

If you would not turn to the remedy under those or any other circumstances, your mind set suggests a question. Given the fact that so many folk remedies seem preposterous to a public accustomed to visiting medical

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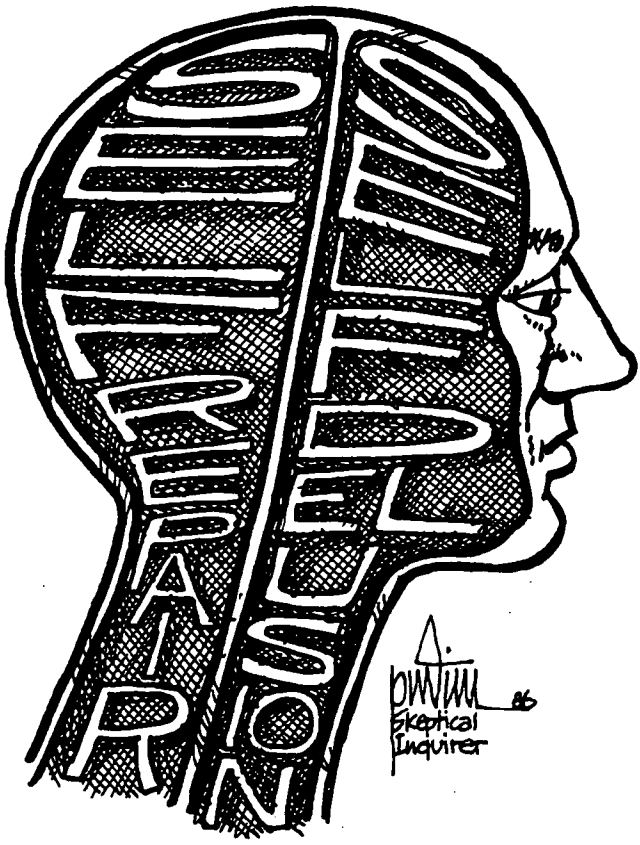

doctors, why did such a large body of folk medicine develop? And, more important, how could it have been deemed to be successful? The answer to the first question is simple: The anguish of suffering from injury and disease is so great that remedies had to be sought. If you spared the mule's calluses on your remote expedition and your tooth still ached, it is fairly certain that you would begin experimenting with other simple expedients—perhaps placing cool or warm water on the tooth or massaging the gums. We all reinvent folk medicine, however crudely, when we are in pain and without help or useful knowledge.

The answer to the second question is far more complex. Two theories, one physical, one psychological, are commonly used to explain the success of folk medical systems. Studies show that perhaps a third of folk remedies, even if they cannot cure the targeted ailment, offer some benefits to the

recipients. Herbal teas, for example, may be high in vitamins that serve as catalysts in cell reactions and therefore promote the body's healing processes. People have occasionally stumbled upon natural antiseptics and antibiotics. As to psychological benefits: since much disease is psychosomatic—a person's attitude has much to do with the severity of a disease and with the ability to recuperate—any attention and care given to a patient, even though the physical methods used are improper, may be beneficial. Mothers who kiss a child's minor scrapes and wounds intuitively understand this.

These two theories have a measure of truth to them, but their combined force is inadequate to explain both the extent of, and the belief in, folk medical practice.

Folk medical practitioners, at least those who are isolated from modern medicine and do not have to fear being chastised for their failures, are certain of the efficacy of their remedies. It is, in fact, ironic that medical doctors with all their formal training are far more likely to admit that their practices can fail than are folk practitioners. An allergist, for example, in explaining the procedures for desensitizing a patient to an allergen, has to admit that the process is not always successful, that there are nonresponders for whom the expensive shots simply may not work. Such doubt is seldom found in a shaman or an herb doctor. Yet the pervasiveness of folk medicine and the confidence of the folk practitioners cannot be fully accounted for merely by vitamin-laced concoctions or by engaging bedside manners.

To unravel this mystery—how can "medical" practices that have a low probability of success become rigidified into a system that is considered successful—I shall allude to the practices of Dr. Benjamin Rush, a physician, social activist, signer of the Declaration of Independence, and, in spite of his Edinburgh medical degree, a proponent of folk medical practice.

In 1793, Philadelphia, the already crowded capital of the newly formed American nation, absorbed a large number of immigrants from a slave revolution in Saint Domingue. These French colonials brought with them an unwanted guest, the infectious viral disease yellow fever. In the hot days of August, the disease spread quickly and panic ensued, causing much of the city to be evacuated. A number of courageous physicians, among them Benjamin Rush, elected to stay behind to minister to those who could not afford to flee. These physicians were severely hampered in their attempts to control the disease. There was as yet no knowledge of infectious microorganisms, and theories of the mechanism by which the disease spread, though hotly debated, were inaccurate.

Dr. Rush, a deeply religious man, suffered considerably because of his inability to help his patients, who, tortured by frightful symptoms, which included the vomiting of black fluids, were dying without relief. Rush frantically searched the printed literature for some promising cure. One manuscript caught his attention. John Mitchell, who had treated yellow-fever patients in Virginia a half-century earlier, recommended using extensive purges to clear the abdominal viscera of bilious humors. Most physicians, Rush included,

had been using mild tonics, mild bleedings, and cool baths to try to cure the fever. But nothing seemed to work. Now Rush was confronted with the idea that the cautious and conservative practices of most physicians might be responsible for the low rate of recovery. No matter how weak the patient seemed, the "putrid miasmata" in the body had to be expelled. A physician could not afford to be faint-hearted: the weaker the patient, the stronger the purgative must be.

Though intrigued by the theory, Rush was understandably reluctant to try such a radical procedure. An opportunity arose for him to test it, however, when he came upon a man who was almost dead and for whom no hope of survival remained. Rush administered a radical purgative, and the patient miraculously revived. When several more patients treated in the same manner recovered, Rush was convinced he had found a cure for the disease. He turned to the heaviest purgative that he knew of, a concoction of ten grains of calomel and fifteen of jalap. In addition to the purgative, he prescribed heavy bleedings. Some of his patients began vocally to testify to the success of his method and, in the ensuing months, he became a folk hero sought out by ever increasing numbers of the afflicted. In spite of working exhausting hours, he could not reach everyone who sought his aid, and so he published his remedy in the *Federal Advertiser* in hopes that those he could not reach could administer the cure to themselves.

Before the plague was over, it had claimed more than 4,000 victims. Rush, in *An Account of the Bilious Yellow Fever of 1793,* contended that the heavy loss of life had to be blamed on the physicians who failed to utilize his cure. Because he was convinced of the efficacy of his procedure and of the incompetence of his colleagues, he argued that "it is time to take the cure of pestilential epidemics out of the hands of physicians, and to place it in the hands of the people."

What Benjamin Rush did and what he wrote is illustrative of what happens in folk medicine. A hopeless situation arises in which human health is endangered. Some expedient is devised to combat the disease. It works, and then it becomes circulated and widely recommended, eventually rigidifying into a practice. In Rush's case, though he had a formal medical degree, he went so far as to disavow the formal practice of medicine when he became convinced that people could become medical practitioners, provided they were armed with his cure.

If Rush's remedy sounds a little too good to be true, it is. His procedures could have had no positive effect in curing yellow fever. Indeed, it is surprising that anyone who underwent the regimen survived it, much less the combination of it and yellow fever. Calomel contains mercury, an extremely toxic substance when ingested. Though yellow fever has a corrosive effect on the intestines, postmortem examinations of several of Rush's patients demonstrated that the damage to the intestines was greatly magnified by his purgative. The bleeding that Rush recommended was based on the faulty assumption that the body contains twice as much blood as it actually does; in several

days, were his recommendations carefully followed, more blood would have been drained from a patient than the human body contains.

What then happened? I think an answer to the question helps explain the belief in folk medicine, especially since, in a sense, Rush's methods were folk methods.

Success in folk medicine is a result of a combination of the way the human body and the human mind work. An understanding of what is happening in one without the other is insufficient.

Modern science has taught us that the human body, insofar as it is cured, tends to cure itself. The body is its own greatest protector: the immunological system, which produces antibodies to fight antigens, accounts for almost all recovery from disease. Even the expensive trappings of a modern hospital are merely meant to be aides to this functioning. If a diseased human organ, an infected appendix or a kidney, is removed surgically, it is still the patient's body that must heal the wounds of surgery and repair damaged cells. The surgical procedure, in other words, does not cure the patient, it merely increases the body's chance of not being overwhelmed by infection. Nothing can save the patient if the internal system breaks down. This accounts for the terror associated with a disease like AIDS, which is so threatening because it is an immunological deficiency that renders the body defenseless. This is not to belittle medicine; its discoveries are prodigious and its contributions to health salutary, but the success of modern medicine depends on an understanding of how the healthy body protects itself.

In Benjamin Rush's case, what probably happened was that he administered his remedy to a number of patients just at a moment when they were about to recover; certainly this must have been the case with the first miraculous recovery. It seems to have been a fairly common pattern in the disease for an individual to seem to be on the verge of death only to be up and about within the course of the day. Probably the virus had been defeated by the immunological system, but the exhaustion and fatigue of fighting the disease left the victim in a seemingly hopeless condition. When one sees such a recovery take place and has a theory in his mind that a particular medical procedure should produce such a cure, it is hard not to assume a cause-effect relationship. Certainly a man of good will, who had seen much death and suffering and who was by his own accounts deeply attached to his patients, must be excused for failing to see that the miracles he observed were not of his making.

There is, of course, a problem with such an explanation. Simple mathematical odds would preclude a large number of miraculous recoveries taking place in the manner just described. One would assume, then, that the physician would see just how poor the rate of recovery for his patients was and that the system would collapse.

It is here that the second part of the formula must be called upon: the part that looks at the role of the human mind in belief systems. The human mind is the universe's gullible machine. When there is a strong need to believe

in a system, the human mind can become extremely uncritical. The need for using a double blind in scientific research attests to this. In his book *Flim-Flam!* James Randi, a professional magician who understands well what tricking an audience means, offers a detailed explanation of how people who uncritically believe in paranormal phenomena delude themselves. One of the points he makes is that, once someone is convinced of the truth of an idea, it becomes very easy to either ignore or rationalize away negative evidence. Rush's own publication on the yellow-fever epidemic demonstrates that he fell into precisely this trap. Although he lost his own sister and a number of close associates to this plague, in spite of administering his cure to them, he found ready excuses for all his losses. It must be remembered that his initial thrill over the success of his method resulted from his believing that a radical procedure could undo radical damage and bring patients back from the edge of the grave. And yet, when he had to account for his sister's and his pupils' deaths, he lamented that the large number of patients who came to visit him caused his house to be filled with such a "concentrated miasmata" that remedies simply could not be expected to save its inhabitants. The patients he did save, and he counted himself among them, were proof of the success of his method.

I would suggest that the example of Benjamin Rush is a paradigm for the way in which folk remedies develop. Somone is sick; in desperation, something is tried. The person recovers, as most humans do from most ailments, and the cure is ascribed not to the body's ability to cure itself but to the remedy. The remedy then is taken into the general system of folk beliefs, whence it becomes hard to dislodge. When an individual fails to be cured by the remedy, the practitioner resorts to one of a number of explanations: the patient was already too sick; a careless underling did not properly administer the remedy; the patient was so immoral the gods did not allow a cure. Rush used the first two of these excuses even though he came to use his system because the purgatives seemed to save the most hopeless patients.

If this explanation of the pervasiveness of folk remedies in light of their seeming foolishness is not convincing, remember this: The human body can recover from virtually any infectious disease. The efficacy of a remedy is constantly being reinforced by samples of "success," even when the remedy makes no contribution to the recovery at all; or, as in Rush's case, probably reduces the chance of recovery.

If we return to the original toothache remedy, this theory might seem to be confounded. The rotting of a tooth is degenerative, and relief would not be brought until the tooth were repaired or extracted. Therefore, it might be argued, success could not result from the remedy, and the remedy's existence could not depend upon an accidental cure. But, since the actual ability to cure a targeted ailment is not a necessary condition for the existence of a folk remedy, one of several things might have happened. The throbbing associated with a toothache is often intermittent, especially in the early stages of decay. The remedy might have seemed to bring temporary relief. There are also such

things as "false" toothaches, which result from pressure in the sinus cavities. Were such a condition to clear up within a reasonable time after the smoking of a mule's "chestnuts," then the remedy might survive several failures. It takes only some positive evidence, not an actual cure, to keep a remedy in circulation. This is certain: the remedy is recollected because someone *thought* it worked.

In folk medicine, then, a pattern something like this works: Because the human body repairs and heals itself, anything that is temporally interposed between sickness and recovery can come to be interpreted as the cause of healing. Once it is assumed that a procedure is efficacious, a small amount of "positive evidence" is enough to overcome failure in a majority of cases, because the human mind, protecting its belief-systems, reasons away the failures.

Note

The remedy that appears in the introductory quotation comes from Freddie Vaughn and Frank Reuter, "Negro Folk Remedies Collected in Southeast Arkansas, 1976," *Mid-South Folklore*. 4 (Summer 1976):71. Much of the information about the 1793 yellow-fever epidemic comes directly from Benjamin Rush's *An Account of the Bilious Yellow Fever of 1793*. An excellent historical analysis of the Philadelphia plague can be found in J. H. Powell's *Bring Out Your Dead* (Philadelphia: University of Pennsylvania Press, 1949). •

Dentistry and Pseudoscience

American dentistry is being flooded with disproven and unproven methods.

John E. Dodes

AMERICAN DENTISTRY is being inundated with a plethora of disproven and unproven methods. Many factors have led dentists to first accept and then promulgate fraudulent health philosophies. It is important to be aware of some of these "holistic" practices and to examine the weaknesses in our education and health-care systems that allow them to proliferate.

Dental school is basically authoritarian; memorization, not understanding, is what is needed for success. Surprisingly, very little about the scientific method is taught, and virtually no research or study of basic scientific logic is included in the curriculum. This leads inexorably to the easy acceptance of fallacious ideas.

Dentistry is a cottage industry, with the vast majority of dentists in solo practice. This allows the dentist to perform treatments without the critical appraisal of colleagues. But what of the American Dental Association, other dental organizations, and continuing-education courses? Unfortunately, membership in the ADA is voluntary, and it is considered to be an educational rather than a disciplinary organization.

Any group of dentists can form an impressive-sounding association; there is even a National Board of Homeopathy in Dentistry. Many of these organizations have journals that publish invalid, poorly executed, and anecdotal studies. Because dentists do not receive the training they need in scientific method, one sees correlation being mistaken again and again for causation throughout these nonrefereed journals. These groups also may award "diplomate" or "fellowship" certificates to dentists who take courses they sponsor or to those dentists who just belong and pay dues. These certificates can be very misleading to the public.

The continuing-education departments of many dental schools have abro-

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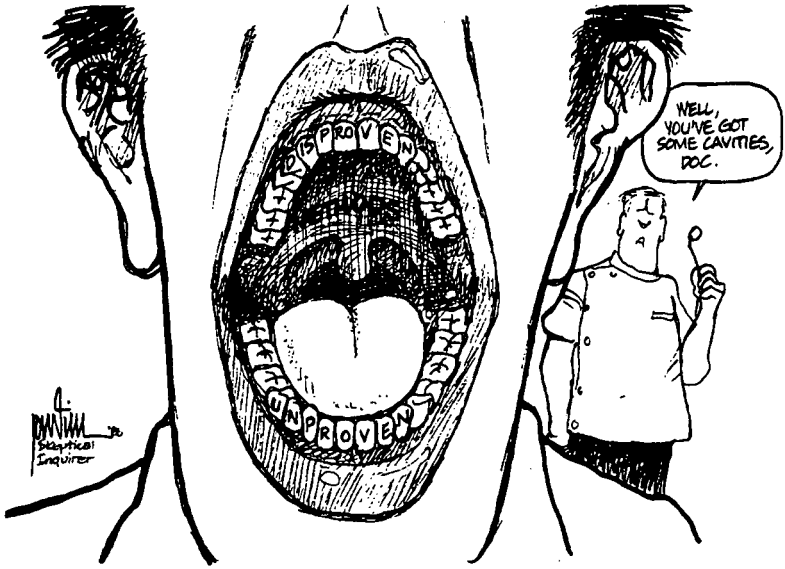

gated their responsibilities to skeptically scrutinize the teachers and the courses given under the imprimatur of the dental school. More than 104 courses on blatantly false health-care methods were given at American dental schools in 1985. The participating dentists are not told that they are receiving fringe, discredited, or unproven theory. Instead, they are impressed by the authoritarian figure lecturing them from the university lectern. There seems to be a fear of being labeled a "censor," and of course these lectures also earn money for the school.

The following is a short list of courses that are being given for continuing-education credit at many dental schools:

Reflexology. This is the diagnosis and treatment of disease by examining and massaging the soles of the feet.

Acupuncture. This discredited technique (see *Lancet,* May 26, 1984) is taught widely to both dentists and physicians. Dentists usually are taught auriculotherapy, or acupuncture of the ear lobe. Perhaps by working close to the mouth these dentists feel they will avoid being accused of practicing medicine without a license.

Nutrition counseling. Many dentists have found it profitable to sell vitamins and food supplements to their patients. They often base their faulty advice on such discredited tests as hair analysis, the lingual ascorbic acid test, and cytotoxic testing.

Kinesiology. This is an offshoot of chiropractic, and like chiropractic it is based on false theory of how the human body works. Many patients who

complain of facial pain are diagnosed as having "TMJ" (temporomandibular joint, the jaw joint) syndrome. Using kinesiology for diagnosis, practitioners put patients through invasive grinding of their teeth, insertion of bite-changing appliances, and even jaw surgery, in spite of the fact that research shows that jaw exercises, moist heat, and anti-inflammatory or muscle-relaxing drugs like motrin or valium are equally effective.

Cranial osteopathy. The bones of the skull are tightly and immovably sutured together, but this theory says that they move and that, although this movement cannot be detected by the finest scientific instruments, the delicate fingers of the cranial osteopath can not only feel the vibrations but can readjust them for optimum health—at an appropriate fee.

Mercury toxicity. The silver fillings a dentist places in patients' teeth are really a mixture of a silver/tin/copper/zinc alloy and mercury. While all major health organizations recognize the safety of silver fillings, a small group of dentists are blaming a host of diseases and conditions, such as multiple sclerosis, Parkinson's disease, immune deficiency diseases, and emotional conditions, on the minuscule amount of mercury that *may* leak out of a filling. They recommend that all silver fillings be removed and replaced with either plastic or gold, a very profitable recommendation. (The March 1986 *Consumer Reports* published an investigation of this practice.)

"Holistic dentistry." All of the theories mentioned above and many more form the basis of "holistic" practice. These dentists are "wellness" oriented. Although "wellness" is not in the dictionary, it appears to be the disease the "holistic" dentist treats and gets paid for treating, although the patients are perfectly healthy.

Dentists are attracted to quackery because of ego and greed. To be at the "forefront" of your profession can be a powerful motivator. Add to this the tremendous profit generated by health fraud and one could have a severe loss of objectivity.

Greed and gullibility go hand in hand. Fluoridation and the economy have led to a reduced demand for dentistry. This, coupled with advertising, has greatly affected the normal practice of dentistry. Today dentists are greatly concerned about finding new ways of attracting and treating patients. Too many are resorting to questionable, fringe, or even fraudulent treatments as the answer. This allows the practitioner to diagnose disease where none exists and gives him a distinct advertising edge over ethical dentists. Gresham's Law in economics states that the bad money will force out the good; will the fringe practitioner force out the ethical dentist because in the eyes of the unsophisticated public the dentist who makes outrageous health promises has a competitive advantage?

The public must be made aware of the failures of our educational and health-care systems. The consumer term *caveat emptor* has never been more valid than when dealing with modern dentistry. •

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Atmospheric Electricity, Ions, and Pseudoscience

Claims of alleged effects of natural atmospheric electricity (including ions) on biological entities and human well-being are unscientific and unsupported.

Hans Dolezalek

SCIENTISTS WORKING in the field of atmospheric electricity are accustomed to the emergence of surprising beliefs about things electrical in the air surrounding the earth. Many of these beliefs involve claims that natural ions, positive or negative, have demonstrated effects on biological specimens and even on human well-being.

Apparently not even the SKEPTICAL INQUIRER is immune to misconceptions in this area. For example, the article "The Moon Was Full and Nothing Happened," by Kelly, Rotton, and Culver (10:129-143), contains a statement (p. 137) that would cause considerable laughter if it were read to the next International Conference on Atmospheric Electricity: "Although positive ions are more prevalent when the moon is full, positive ion concentrations related to lunar variations are small when compared with those related to air-conditioning and air pollution."

The reference given for this statement is an article by D. E. Campbell in *Environment and Behavior* (14[4], 1982). The authors also refer to a paper by S. J. Garzino that appeared in the same issue of that journal. If you were to read both the Campbell and Garzino papers, you would find that Campbell in general discredits Garzino's statements, but seems to accept that funny story about the positive ions at full moon, which Garzino states as fact.

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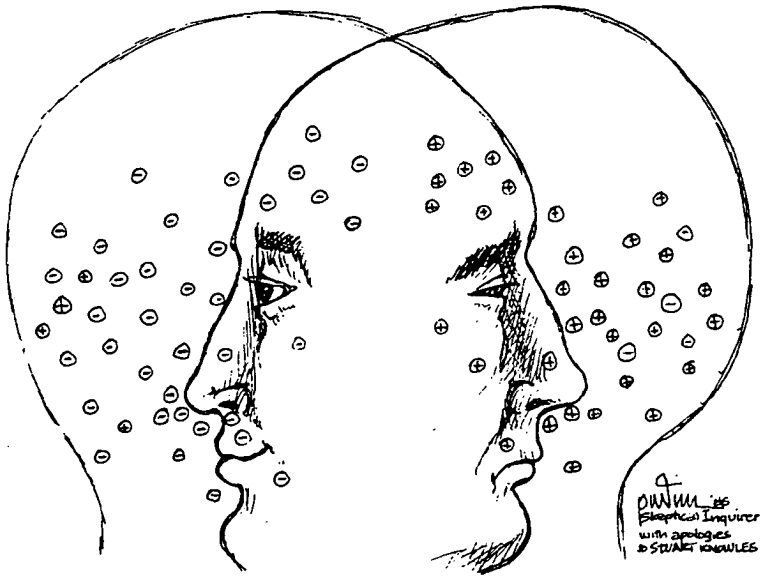

Garzino, an assistant professor of social welfare, might well be a genius, but a little more skepticism with regard to a statement of his on matters of physics or geophysics may be appropriate. At least we should ask where Garzino got the facts for his assumption. (He does not say.)

Atmospheric electricity became a science when on May 10, 1752, it was demonstrated that Benjamin Franklin's prediction was true: Lightning is an electrical phenomenon, and so there are electrical processes in the atmosphere. Since then, this has developed into a rather complicated and not very well known field of science, involving knowledge on a number of interdisciplinary topics, among which the knowledge of the physics of weak plasmas and certain parts of electrostatics is not widespread. In earlier times, it was investigated by such well-known scientists as Volta, Coulomb, Peltier, Lord Kelvin, Rutherford, C. T. R. Wilson, and many others; and, in our time, it is the major object of research of several university departments in this and other countries. In part because of the stringent challenges for its study, and in part because practical applications of this science are not readily visible to the wider public, the number of workers occupied mainly with atmospheric electricity is only a few hundred in all countries of the world together. However, there seems to be a larger pseudoscientific field.

Every four or five years, about 200 to 300 dedicated workers gather for an international conference on atmospheric electricity, but there has never been a paper presented dealing with the alleged atmospheric electric (including ions) effects on biological specimens, simply because these claims have been acknowledged to be unscientific. There have been, however, special con-

ferences conducted by this community and dedicated to that question because, if the claims of some of the biologists are true, they certainly should be dealt with. Also, this then could open new areas of activity for the physicist of atmospheric electricity. Nothing of this kind emerged from these conferences and other discussions.

Here let me make a few relevant statements:

1. The large and growing literature promoting the pseudoscientific belief in atmospheric electric effects on people and other organisms lacks contributions from the scientific community of atmospheric electricity, and the biologists (who sometimes are well-established scientists in their own field) often do not know enough of physics to avoid severe errors that invalidate their statements; vice versa, the fundamental books written by scientists on atmospheric electricity do not report these claims because they could never be proved.

2. For example; one often repeated claim is that the refreshing feeling one may encounter near a waterfall or at the seashore is due to the production of an abundance of negative ions. It is true that waterfalls produce negative ions, but when saltwater waves break they produce positive ions, a fact that the people making the quoted claim obviously do not know. According to the other claims of these people, positive ions allegedly have a depressing effect.

3. Another example: The refreshing feeling after a thunderstorm is, according to those sources, a consequence of the production of an abundance of negative ions under the storm. It is true that a thunderstorm produces on the average somewhat more negative than positive ions in the atmosphere near the ground, but the fresher air following it is produced by rainstorms because of the cleansing and cooling effect of the rain, and by frontal thunderstorms because the onrushing air is cooler; nonraining nonfrontal storms produce as many negative ions but do not provide the refreshment. On the contrary, the effect of the hot, humid atmosphere may even be more depressing after such a storm.

4. The U.S. Food and Drug Administration does not allow any mention of the alleged positive health effects of machines producing negative ions because that would violate the principle of truth in advertising. (In fact, because during evolution man was not exposed to the very high ion rate produced by these machines, so large an abundance of ions may even be unhealthy in the long run; we do not know.)

5. For more information, refer to the papers by Reiter, Dolezalek, and Kröling (1985) mentioned below.

I have heard that about 10 million ion generators are sold each year in this country; and some hospitals have installed them in their air-conditioning systems. The ion generators generally create a highly unnatural environment because they produce a much higher ion concentration than is found in nature. That is not without a certain risk. Producers of ion generators frequently praise them by pointing out that man is exposed to ions in nature

(but may be lacking them in a modern environment), but they neglect to say that they create a much more unnatural environment by producing too many. I do not want to say that ions in such extremely high and unnatural concentrations have no influence on biological specimens, but even that is, to say the least, doubtful and has certainly not been generally proved.

The production of 10 million ion generators a year would show that large commercial interests are involved. I should not blame the SKEPTICAL INQUIRER if it does not want to deal with this problem and run the risk of court trials for damaging business, but I trust it will refrain from *supporting* such unproven and often outright false claims.

In addition, there are also claims that the atmospheric electric field has an influence on living things. Some people claim that this influence is bad and offer Faraday Cages to use around the bed, or shirts with metallic threads, connected by a long wire to the water faucet, for protection. Others claim that it is good. Some of them say that therefore old wooden houses are healthier than modern ones made of reinforced concrete. Others offer installations to create artificial electric fields in living rooms and offices. The first group obviously does not know that a tent of paper already screens out the atmospheric electric field, because the conductivity of paper (and of wood) is much higher than that of air. The second group creates again an unnatural environment for the living and working quarters of mankind. Very high electric fields (much higher than the natural ones), as well as A.C. fields, of course, do have an effect: for example, even moderately high fields move the hairs in animal fur, which such animals will note and may like or dislike. Or, if the fields are so high that they create electric currents in the body that are as large or larger than biological currents, an effect is to be expected. In this regard, we should not forget that the modern environment of many people contains significant electric fields. (A good investigation was published a few years ago by R. Reiter.) If you pull a sweater over your hair and see small sparks, it means you had an electric field of several millions volts per meter at your head.

In conclusion, there is no proof that the *natural* atmospheric electric field has an influence on human beings (with the exception of their getting hit by lightning, of course). To reduce misunderstandings, I want to state expressly that any intentional or unintentional applications of artificially generated electrical fields, ions, etc.—such as they often occur in the modern environment—are not part of the science of atmospheric electricity. A recent name for these influences is bioelectromagnetism, and there is at least one particular scientific society dedicated to investigations from that field.

Note

The most comprehensive book on atmospheric electricity is that by H. Israël, published in German in 1957 and 1961, and then in a revised version in English: Hans Israël, *Atmospheric*

Electricity, 2 vols., Jerusalem, 1971 and 1973; and also by the National Technical Information Service (Springfield, Va. 22151), 1971 and 1973, #TT 67-51394/1 and /2, 796 pp., 333 figs., 80 tables, 1, 114 refs., 39-page subject index.

The most comprehensive updating (though not the last one) is: Hans Dolezalek and Reinhold Reiter, eds., *Electrical Processes in Atmospheres* (Darmstadt: Dietrich Steinkopff, 1977), 865 pp.; indices: Authors (12 pp.); Chemical Symbols (2 pp.); Localities and Areas (3.2 pp.); Institutes (4.2 pp.); Subject (32 pp.).

Three recent papers deal fundamentally with aspects of claims related to atmospheric ions. All were published in *International Journal of Biometeorology*, 29(3):207-242, 1985: Reinhold Reiter, Preface, pp. 209-210; Hans Dolezalek, "Remarks on the physics of atmospheric ions (natural and artificial)," pp. 211-221; Reinhold Reiter, "Frequency distribution of positive and negative small ion concentrations, based on many years' recordings at two mountain stations at 740 and 1780 m aSL," pp. 223-231; P. Kröling, "Natural and artificially produced air ions—A biologically relevant climate factor?" pp. 233-242. •

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Noah's Ark and Ancient Astronauts: Pseudoscientific Beliefs About the Past Among a Sample of College Students

Creationist views are tied to a deeply held set of values and world-view. Cult archaeology and other pseudoscientific beliefs are unrelated to most such variables.

Francis B. Harrold and Raymond A. Eve

MOST PEOPLE are curious about the distant past, especially that of our own species. This curiosity has led to the rise of archaeology and related sciences, which have given us a growing understanding of human origins and prehistory; but it has also spawned some of the most outlandish pseudoscience on record. Many people readily accept baseless claims about the past—including college students, as one of us (an anthropologist) has come to learn while teaching courses in archaeology and human evolution. Students who held such beliefs when they entered these classes did not always change their minds when they were exposed to scientific approaches to the past. One student wanted to leave no doubt as to where he stood; at the end of a test on the human fossil record, he wrote, "Of course I don't believe any of this. I believe in the Bible."

Such encounters aroused our curiosity concerning these pseudoscientific beliefs among our students. The result was a research project, using the perspectives and methods of social science, to learn more about these beliefs: how widely and strongly they are held, by whom, and why. The research (for a more detailed report, see Eve and Harrold 1986) helped us progress toward answering these questions and suggested ways to deal with such beliefs.

The beliefs we studied can all be described as pseudoscientific. Their proponents claim scientific status, or at least that their methodology equals or surpasses that of orthodox science (e.g., Morris 1974a, 8–10). Nonetheless, they consistently ignore basic requirements of scientific research, such as generating testable hypotheses and thoroughly considering relevant evidence (Schadewald 1983; Cole 1978, 1980).

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Our experience suggests that these beliefs are divisible into two categories. (1) *Creationism*, including so-called "creation-science," substitutes a more or less literal interpretation of the account of creation in the Book of Genesis in place of scientific understandings of the origins of the earth and mankind. (2) *Pseudoarchaeology*, or "cult archaeology" (Cole 1980), includes a variety of sensational claims about man's past, from "psychic archaeology" to Erich von Däniken's famous ancient astronauts. These beliefs lack any foundation in evidence or theory, but have numerous, sometimes passionate, proponents.

There are important reasons for learning more about such beliefs among college students. First, an important function of higher education should be to impart some understanding of the past and, with it, a context for understanding the present and the future. "Not to know what happened before one was born," said Cicero, "is always to be a child."

Just as vital is the implication of these beliefs for science education. Students who are convinced by the arguments found in *Chariots of the Gods?* or who think that creationism should be taught in public schools alongside evolution (which they call "just a theory") do not understand much about what science is or how it works. Our need for an informed citizenry, able to deal with scientific and technical public issues, is increasing. However, the prospect of increasing the "scientific literacy" of the American public (Miller 1983) is not encouraging if college students—a highly educated segment of that public—commonly hold such beliefs.

Previous Research

In recent years, many publications have appeared dealing with creationism (e.g., Montagu 1984; Godfrey 1983) and cult archaeology (e.g., Cole 1980; Stiebing 1984). They have filled the need for expositions of the scientific and logical bankruptcy of these beliefs, but have contributed little empirical research and little to our understanding of such notions as social phenomena.

At the same time, sociologists and social psychologists have compiled a body of research on various pseudoscientific beliefs and their relationships to many social background and personality factors (e.g., Tobacyk and Milford 1983; Singer and Benassi 1981a, 1981b; Emmons and Sobal 1981). These studies have yielded valuable insights, but have dealt primarily with beliefs related to extrasensory perception (ESP) and almost never with creationism or cult archaeology.

Relatively little empirical research on these beliefs is available. Some indications of the prevalence of creationism are found in public opinion polls; a recent Gallup poll, for instance, found that 42 percent of respondents reported holding a belief in the direct creation of man within the past several thousand years (Moore 1983, 103). Social researchers sampling the adult population have found that conservative and fundamentalist Protestants tend to reject evolution (Bainbridge and Stark 1980) as well as to support the Moral Majority more strongly than other people (Shupe and Stacey 1982).

Several studies have dealt, as ours did, with college students. Sixty-two percent of a sample of Ohio biology students accepted evolution, though they did not always understand what the term meant (Fuerst 1984). William S. Bainbridge (1978) reported that, in a Washington sample, belief in ancient astronauts was positively related to various other pseudoscientific beliefs (such as astrology and UFOs), while creationism was unrelated to any of them. Similarly, Bainbridge and Rodney Stark (1980) found that students who were born-again Christians tended strongly to reject a similar set of pseudoscientific claims. In a previous study, to which our own owes much, Kenneth L. Feder (1984) examined creationist, pseudoarchaeological, and general pseudoscientific beliefs among Connecticut college students and found highly variable levels of acceptance. Some of his results will be compared with ours below.

Our research was intended to provide data that could be compared with Feder's, while also proposing and testing hypotheses about relationships among beliefs and background variables. We thus hoped for a better understanding of both the prevalence and the etiology of these beliefs.

Hypotheses

A guiding factor in formulating hypotheses for our study of a sample of Texas college students was our expectation that creationist beliefs are not closely related to pseudoarchaeological ones. This expectation derives from both the research cited above and from the creationist and cult archaeology literatures, which seem to operate in two different domains. Cult archaeology writers often appear to be disposed toward other brands of pseudoscience, borrowing their tenets freely—witness the deft union of mysterious ancient sites with UFOs by von Däniken, and with ESP by Jeffrey Goodman (1977)—while largely ignoring creationism. For their part, creationist authors (e.g., Morris 1974a) are unconcerned with standard pseudoscience topics, but are not shy about proclaiming their religious beliefs.

Creationism: We propose that creationist belief can be understood in the context of what sociologists call the "politics of lifestyle concern" (Page and Clelland 1978). In this perspective, the prescientific creationist view of origins is not an isolated belief. Rather, it is acquired and maintained as an element of cultural fundamentalism, a sociopolitical movement that involves a socially and religiously conservative lifestyle and world-view that cuts across class lines (Page and Clelland 1978; Lorentzen 1980; Harper and Leicht 1984). Cultural fundamentalists feel that their way of life, and not just a theory of origins, is under attack from "secular humanists" in government, the media, and education. In turn, they see evolution not merely as a scientific theory, but as the basis for secular humanism, which they feel leads to a host of moral and political evils (e.g., Morris 1974b, 161–168, 178–194). Some cultural fundamentalists are conducting a counteroffensive that might even be compared in some ways to the Islamic fundamentalist revival movement. They

are particularly upset by changes in education, where they perceive secularists as trying to undermine their way of life by converting their children to evolution and other dangerous ideas. In this light, their battles earlier in this century to exclude evolution from the schools, and now to insert creationism alongside it, are understandable. We thus propose that creationism among our students is, at least in part, a result of the struggle of culturally fundamentalist parents and churches to resist threatening teachings in what they perceive as a hostile social environment.

We do not argue that this is a complete explanation of creationism among students. Certainly other factors affect these beliefs, notably those pointed out by Singer and Benassi (1981a): (1) heavy and uncritical media attention to pseudoscientific claims; (2) poor understanding of scientific (vs. unscientific) methods; and (3) common human "cognitive biases," or mistakes in reasoning, such as the tendency to perceive order in random arrays of data. However, since these factors should affect both creationist and pseudoarchaeological beliefs more or less equally, they were assumed for purposes of our study to be constant in exploring differences between the two.

If our proposition about creationism is correct, certain observable consequences could be expected. Specifically, we hypothesized that:

1. Levels of creationism in our North Texas, "Bible Belt" student sample should be higher than in Feder's (1984) Connecticut group.

2. Creationist belief should be positively related to conservative religious and political orientation, indicated by a scale measuring support for the Moral Majority's sociopolitical positions (e.g., school prayer, abortion, and ERA), adapted from Shupe and Stacey (1982).

3. Creationism should affect the intellectual life and development of students. In a sense, this is a price paid for maintenance of these beliefs. Since prior beliefs are known to affect learning success (Lawson 1983), and since much of the modern college curriculum incorporates evolution (e.g., biology, anthropology, geology), creationist students should tend to have less overall learning success and lower grade point averages than others. At the same time, since such students have generally been socialized to resist alien ideas, prior college courses relevant to the creation/evolution dispute should have little or no effect on their beliefs, regardless of their success in learning course material. This hypothesis is consistent with findings by Feder (1984) and Bainbridge (1978). Finally, these students have been taught to be wary of unorthodox ideas and can therefore be expected to read fewer books outside of class requirements than noncreationist students.

4. Given their world-view, and the efforts needed to maintain it in a university environment, creationist students should tend to have certain personality traits. Since creationists widely view the Bible as a necessary and inerrant guide to life, present and past, such students should score high on a short scale adapted from a standard measure of dogmatism (Rokeach 1956). And, since individual lives and all history are typically seen by creationist students as being part of a divine plan, they should exhibit a more external

(as opposed to internal) locus of control; that is, they should tend, more than noncreationists, to see their lives as controlled by forces external to themselves. Again, items from a standard scale were used to measure locus of control (Sites 1973).

Pseudoarchaeology: We did not have a set of detailed expectations for pseudoarchaeological beliefs among our students; in contrast to creationism, no social theory has been developed sufficiently to generate them; nor are we in a position to do so in this preliminary study.

However, we did expect that pseudoarchaeological beliefs would not be positively associated with creationist beliefs. From prior studies, it was unclear whether the two would be simply unrelated (Bainbridge 1978) or inversely related (Bainbridge and Stark 1980).

Two suggestions to explain cult archaeological beliefs could be derived from prior work on pseudoscientific beliefs. While not adopted as hypotheses by us, they have implications testable in our study. It has been suggested that many pseudoscientific beliefs serve as "functional alternatives" to traditional religious beliefs, substituting for them by fulfilling similar emotional and cognitive needs (Bainbridge and Stark 1980; Emmons and Sobal 1981). However, in the case of psychic beliefs, James McGarry and Benjamin Newberry (1981) found that such an explanation worked better for heavily involved "true believers" than for college students, who generally had "low involvement" psychic beliefs. John R. Cole's (1980) portrait of some "true believer" pseudoarchaeology fans leaves room for a similar expectation. If so, one could expect a tendency among cult archaeology believers in our sample toward external locus of control, as has been previously found among low-involvement psychic believers.

A popular suggestion some years ago was that the popularity of pseudoscience is due to rejection of the scientific-rational values of our culture (e.g., Tiryakian 1972). Such explanations seemed better during the "Age of Aquarius," with its pervasive youth counterculture, than today, when serious youths seem too busy preparing for their careers to reject the establishment. However, if the rejection thesis is valid for pseudoarchaeology, one could expect that believers would display greater alienation (as measured by items from Schwartz [1973]) than other students.

The Study

We administered a voluntary, anonymous questionnaire to 409 students at the University of Texas at Arlington (enrollment about 23,000), a state university in the Dallas–Fort Worth metropolitan area. Overall, the sample reflected the demographic makeup of the student body fairly well, although arts and sciences majors (63 percent of our sample vs. 38 percent of the university total) were somewhat over-represented at the expense of students in the large pre-professional programs, notably business and engineering.

The 89-item questionnaire collected information on the demographic, educational, political, and religious backgrounds of students. Their responses were also recorded to statements associated with creationist and pseudo-archaeological beliefs, as well as other pseudoscientific beliefs (astrology, Bigfoot, UFOs, etc.). Responses were arranged on a scale ranging from strong agreement to strong disagreement. The scales also distinguished between those with no opinion at all on a topic and those who felt the evidence was inconclusive.[1]

Results

Belief levels: As detailed in Table 1 and Figures 1 and 2, we examined student belief in six cult archaeology claims. Levels varied from low to moderate. Interestingly, and just as in Feder's Connecticut sample, strong believers in claims were far outnumbered by those with weaker belief, and usually also by those with no opinion. Surprisingly, von Däniken's "space gods" claims, the best publicized of the lot, received fairly low support, especially an item specifying that visiting aliens were responsible for ancient monuments (Table 1, no. 1). The space-gods fantasy thus may be losing steam. However, it is still depressingly true that more than 40 percent of our sample were uncertain about ancient astronauts, on grounds of "inconclusive evidence." We might infer that many of them see no way to test such claims about the past.

Where our cult archaeology results can be compared to Feder's, they are quite similar, with no indication of important regional differences in these beliefs. As with Feder's sample, the most popular claim of the six was what Cole (1978) calls "hyperdiffusionism"; more than 40 percent of respondents are under the impression that "America was visited by Europeans long before either Columbus or the Vikings got here" (Table 1, no. 3), despite an utter lack of reliable evidence for such visits. We can at least take comfort in the overwhelming rejection of King Tut's Curse (no. 4).

Turning to beliefs in other popular pseudoscientific topics (Table 1 and Figure 3), we found a range of belief levels similar to that for cult archaeology in our sample, and comparable to Feder's results. Acceptance was highest (more than 60 percent) for prescience (no. 26), the alleged psychic ability to foretell the future. Surprisingly, astrology (no. 28) received the lowest credence (only 7 percent), contrary to some public opinion poll results. Compared with cult archaeology, these claims seem more familiar to students; "Don't know" responses are distinctly fewer. Our college students seem to be largely unaware of most cult archaeology claims. Unfortunately, we also suspect that many are equally unfamiliar with real archaeology.

When we examine belief levels of items related to creationism (Table 1, Figures 4 and 5), a very different picture emerges. Overall belief levels in creationist items in our sample are clearly higher than for other items, ranging from 24 percent to 73 percent (in a group that is 52 percent Protestant and 25 percent Baptist). In comparison with Feder's group, our Texas students are,

TABLE 1

Summary of Responses to the Science and Religion Questionnaire

(N = 409)

Note: "Believe" includes those who thought item statements were "definitely true" or "probably true," and "Disbelieve," those who chose "probably false" and "definitely false." Items are not in their full original wording. Several items were originally reversed to avoid response set.

	Believe %	Disbelieve %	Don't Know %
Cult Archaeology			
1. "Space Gods" (built pyramids, etc.)*	7	68	24
2. Aliens visited the earth in the past*	22	35	43
3. Hyperdiffusion (pre-Viking trans-Atlantic voyages)	41	29	30
4. King Tut's Curse*	9	57	34
5. Atlantis civilization	33	16	51
6. Psychic archaeology	25	21	54
7. "American Genesis" (human evolution in North America)	10	55	35
Creation/Evolution			
8. The world is 4-5 billion years old	55	11	34
9. Theistic (divinely directed) human evolution	48	27	25
10. Nontheistic evolution (unconnected with God)	14	66	20
11. Adam and Eve were created by God†	62	20	18
12. Dinosaurs and man were contemporary	41	35	24
13. Evolution explains the history of life†	51	27	22
14. The Bible is literally true†	41	43	16
15. Creation in six 24-hour days†	24	45	30
16. Noah's flood†	65	13	22
17. Creation should be taught in public schools†	48	38	14
18. Evolution should be taught in public schools	72	15	12
19. Heaven exists†	67	10	23
Other Paranormal			
20. Loch Ness "Monster"	28	40	32
21. Bigfoot (Sasquatch)*	28	41	31
22. UFO's are spacecraft	22	29	39
23. Reincarnation	29	34	37
24. Black Magic	34	42	24
25. Communication with the dead is possible	38	36	26
26. Some can predict future by psychic power (prescience)*	59	22	20
27. Bermuda Triangle*	28	38	34
28. Astrology predicts personality	8	69	23
29. Ghosts exist	35	36	29

*Items comprising cult belief scale
†Items comprising creationism scale

Pseudoarchaeology I

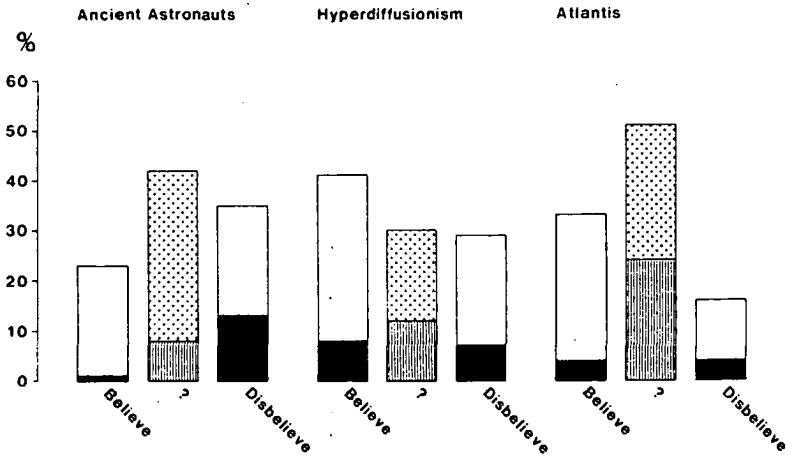

FIGURE 1

Pseudoarchaeology II

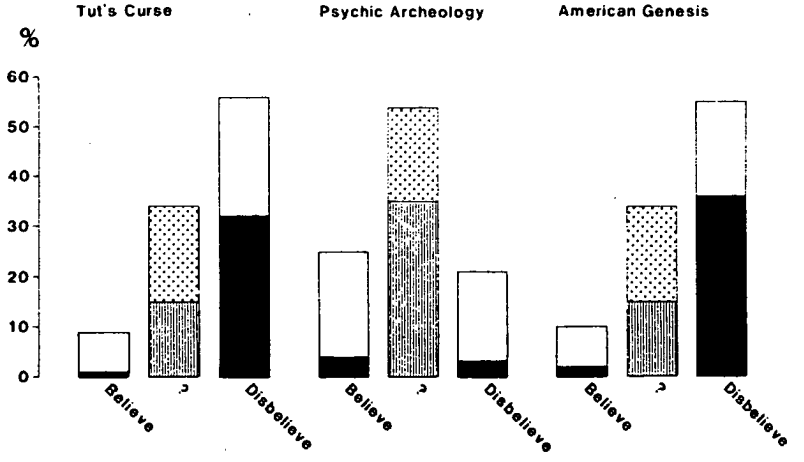

FIGURE 2

Pseudoscience

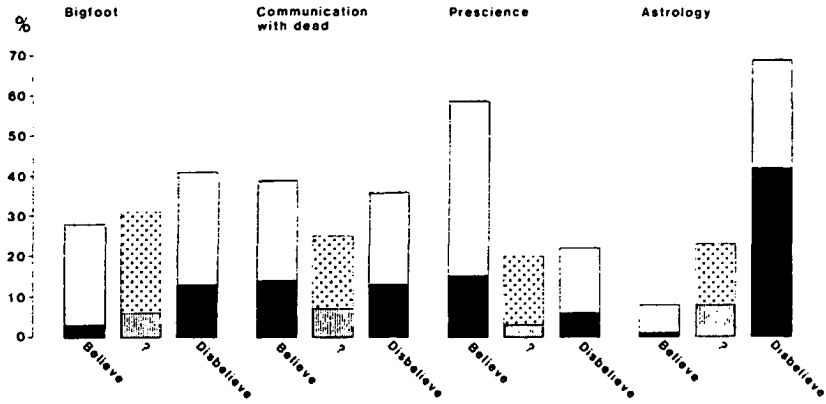

FIGURE 3

Creation/Evolution I

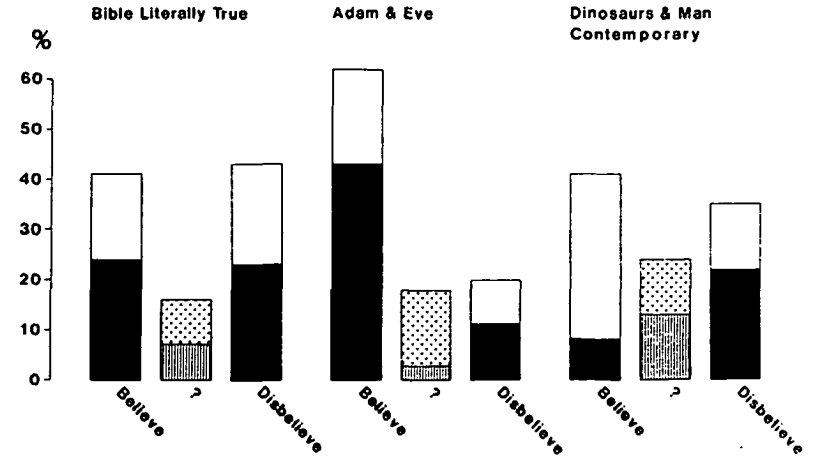

FIGURE 4

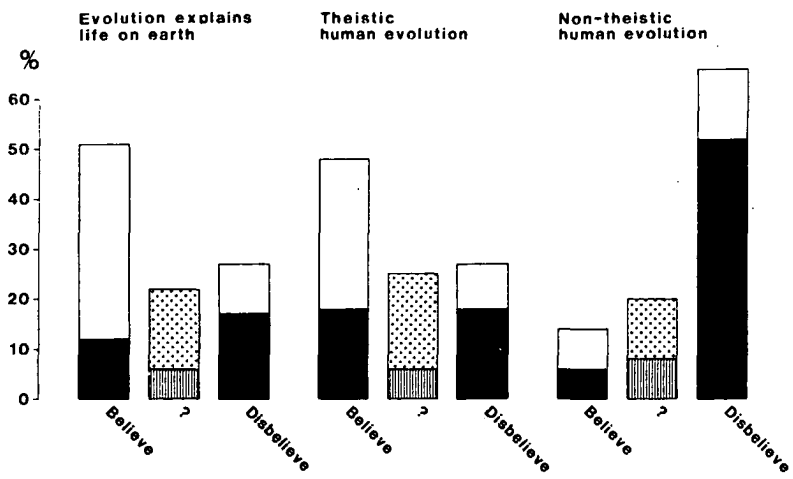

FIGURE 5

as expected, decidedly more creationist, by margins of 10 to 30 percent per item; thus 42 percent accept the Bible as literally true (no. 14); 61 percent believe that God created Adam and Eve (no. 11); and 41 percent think dinosaurs and humans were once contemporaries (no. 12). In this last case, we suspect the influence of reports of the famous "man tracks" allegedly associated with dinosaur tracks in the bedrock of the Paluxy River in nearby Glen Rose State Park (see Cole and Godfrey 1985).

About half of our students think that evolution explains the history of life on earth (though few of them are sure of this)—a distinctly lower percentage than Feder's 70 percent (no. 13). About half also accept human evolution if divinely guided (no. 9). Nontheistic evolution, with God playing no role, is rejected by 66 percent to 14 percent (no. 10). In terms of beliefs with direct political and educational implications, fully 10 percent of our respondents want creation, but *not* evolution, taught in *public* schools! Thirty-eight percent want evolution taught, but not creation. A plurality (45 percent) want both "models" taught in public schools (nos. 17, 18). This last figure is lower than in recent public opinion polls; but, in a presumably well-educated segment of our population, it confirms the effectiveness of the "fairness" argument pushed by creationists ("If there's disagreement over origins, why not teach *both* models?").

Significantly, "Don't know" responses are fewer for items related to crea-

tion than for others, and strong rather than mild belief is commonly expressed (this was also true in Feder's study). On these matters, our respondents are likely to have definite and strong opinions.

Belief Scales and Relations Among Variables: As a first step in further analysis, we utilized a statistical procedure known as factor analysis on the total pool of belief items in order to search for patterns underlying the answers to numerous individual items.[2] Results indicated two independent underlying tendencies behind the observed distribution of responses, associated respectively with (1) creationism items and (2) other pseudoscientific items. Thus, as expected, creationism and cult archaeology sorted into two statistical domains in analysis; however, it is interesting that cult archaeology was *not* separable from other pseudoscience topics like UFOs and Bigfoot.

The factor analysis results were used to select items to construct two belief scales, one for creationism and one for other pseudoscientific beliefs, including cult archaeology. (See Table 1 for scale items.) We then examined the relationships between students' scale scores and other characteristics, with special attention to the hypotheses presented above. For example, do subjects with high creationism scores actually tend to be religiously conservative?

Looking at the creationism scale first, we found that students' scores were unrelated to their sex or age, the level of their parents' education (one indicator of social class), or urban vs. rural origin. However, significant relationships were found in several cases. As hypothesized, a strong relationship (gamma = .47, $p < .0001$) was found between creationism score and self-designated religious conservatism/fundamentalism. We also compared creationism scores with the "Moral Majority" scale mentioned above. The Pearson's correlation (signified hereafter as r) between the two scales was .37 ($p < .0001$). Thus our contention that creationism is related to religious and sociopolitical conservatism is supported.

We had expected more lower grades and less book-reading among creationist students, and results bore out our expectations. A significant negative relationship was found between students' creationism scores and their grade point average (gamma = .24, $p < .0001$). Also, of those students who reported reading only two or fewer books annually outside course requirements, 31 percent were in the quartile of the whole sample with highest creationism scores, while only 18 percent were in the quartile with lowest creationism. By contrast, among those reporting reading 20 or more books yearly, only 18 percent were highly creationist, while 35 percent fell into the least creationist category. The higher a student scored on the creationism scale, the fewer books he was indeed likely to read.

Furthermore, we found that (with the interesting exceptions of courses in logic and anthropology) prior coursework did *not* have significant effects on creationism. In other words, in our study, as in Feder's (1984) and Bainbridge's (1978), college courses in biology, geology, astronomy, and archaeology had little or no effect on students' creationist beliefs.

Also as hypothesized, we found a fairly strong relationship between scores on the creationism and dogmatism scales ($r = .31$, $p < .0001$). Thus the students who were more strongly creationist were more likely to agree with statements like "There are two kinds of people in the world: those who are for truth and those who are against truth." However, the relationship between creationism and external locus of control was, though significant, rather weak ($r = .10$, $p < .05$); creationist students tend only slightly to have an external rather than an internal locus of control.

As for the pseudoscience "cult" belief scale, perhaps most noteworthy is its failure to relate significantly to most of the variables we examined, including several that had proved to be related to creationism (such as grades and books read). Again, prior coursework made little or no difference in cult scores. We found some tendency for older students to be more skeptical; those over age 40 overwhelmingly rejected most cult beliefs on the scale. Cult scale scores were related to *internal* locus of control ($r = .22$, $p < .001$), contrary to expectations derived above for low-involvement believers. While not necessarily supporting the "functional alternative" theory for these beliefs, this result indicates that McGarry and Newberry's findings may not be generalizable from psychic beliefs to all pseudoscientific beliefs. Also, a lack of relationship found between cult score and alienation fails to lend support to the "rejection" hypothesis explaining such belief. Unexpectedly, a slight inverse relationship was found between cult and dogmatism scores ($r = .11$, $p < .05$); that is, there was a mild tendency for more cult-oriented students to be *less* dogmatic—the opposite relationship of that found between dogmatism and creationism.

Finally, we found an extremely weak negative relationship between our two scales themselves ($r = .09$, $p < .08$), i.e., a slight tendency for creationists to reject cult beliefs, and vice versa.

Discussion

Overall levels of pseudoscientific belief were discouragingly high in our sample, though in most respects comparable to those of similar studies. Many college students believe a good deal of nonsense that they suppose to be scientifically respectable. In regard to creationist belief, our students did show a regional contrast with a northeastern sample. No such regional differences were apparent regarding cult archaeology or other beliefs.

Our predictions regarding creationism were largely fulfilled, increasing our confidence that lifestyle-concern issues help to explain the prevalence of such belief. Our results are consistent with our prior impression that these beliefs are tied to a deeply held set of values and world-view and that they are very resistant to change despite their rational flaws.

On the other hand, cult archaeology and other pseudoscientific beliefs were unrelated to most of the variables we examined and are still not well understood. We suspect that this is at least in part because, as Jerome

Tobacyk and Gary Milford (1983) have suggested, these beliefs do not form a single cognitive domain, except when contrasted with creationism at the most general level. That is, they all differ sharply from creationism in terms of who believes them and why, but may well differ from each other as well. Space gods may appeal to people for different reasons than ESP or spiritualism does. Clearly, more research is needed before these beliefs will be understood.

This study has implications for those of us who are interested in the teaching of natural and social sciences. When many college students believe in Noah's Ark or ancient astronauts after completing courses that should teach them to know better, something is wrong with our system of science education.

One avenue of dealing with this problem is the development of better ways of teaching college courses in relevant subjects, with an emphasis on confronting pseudoscience head-on—using it as a tool to teach critical thinking and scientific method rather than ignoring it as beneath notice or too controversial. Such innovations have produced significant reductions in pseudoscientific belief in trials with students (e.g., Tobacyk 1983; Gray 1984).

Necessary though these steps are, they have limitations. Authors reporting on some of these projects were struck less by their success in reducing ESP beliefs than by the high level of residual belief after "dehoaxing" and other steps (Morris 1980; Singer and Benassi 1981b). Pseudoscientific beliefs are often retained for reasons unrelated to their rational adequacy, even when their flaws are pointed out to believers.

We suggest that this problem could be alleviated by better education in science and critical thinking at the elementary and secondary levels, so that fewer college students would find them to be new and exotic subjects, hard to square with their established ways of thinking. If children routinely learned about science as a reliable, understandable set of methods for investigating the physical world rather than as a set of facts that are true by reason of an authoritative, "scientific" source, we suspect that they would entertain fewer pseudoscientific beliefs as young adults.

Acknowledgments

Our thanks go to Mark Plunkett for invaluable help with data collection and analysis, Deborah Wood for data transcription, and the students and faculty whose cooperation made this study possible.

Notes

1. A sample belief item: "God created the universe in six 24-hour days." (1) Definitely true. (2) Probably true. (3) Probably false. (4) Definitely false. (5) Inconclusive evidence. (6) No opinion. (Answer choices 5 and 6 on each question were created to differentiate between the skeptical or uncertain and the "ignorant," who did not know enough about an issue to have any opinion at all. They were combined in later portions of the analysis in which questions were grouped into scales. Prior to this stage, however, "No opinion" and "Inconclusive evidence" were left separate.)

2. Factor analysis statistically analyzes the intercorrelations between responses to a large number of questions to attempt to detect "factors," underlying forces that operate in such a way as to cause certain items to intercorrelate highly. The technique is often used to see if all items in a pool can be treated as if they measured the same underlying phenomenon, or whether more than one underlying dimension causes multiple distinct clusters of items. We used a principal-factors analysis to determine the number of factors present in our data as represented by a plot of the Eigenvalues, and then used the relevant number of factors (2) to conduct a principal-components analysis to create the scales. The scales themselves were composed of items added together and unit-weighted.

Strictly speaking, some statistics texts suggest that researchers avoid using factor analyses to develop scales based on a pool of respondents, and then measuring the intercorrelations between the produced scales in that same pool of respondents. However, such a procedure is widely followed, as it was here, in exploratory research. This can be defensible if one is cautious in determining that factors make conceptual sense and are not merely the result of "rabid empiricism," and if one recognizes that the results cannot automatically be generalized beyond the original population. Ideally, scales developed from such exploratory analyses should be retested to assess the stability of the originally detected intercorrelations in new populations (which we are currently doing with colleagues in Connecticut and California).

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The Woodbridge UFO Incident

Investigation of a claimed UFO landing near a U.S. Air Force base in Britain puts it in a new light.

Ian Ridpath

In December 1980, something remarkable allegedly occurred in Britain outside the U.S. Air Force base at Woodbridge, near Ipswich. News of the event leaked out slowly, finally hitting the headlines in October 1983: "UFO Lands in Suffolk—and That's Official," screamed the front page of the *News of the World,* Britain's best-selling Sunday tabloid.

The story was sensational. It told of a group of American airmen who were confronted one night with an alien spaceship in Rendlesham Forest, which surrounds the Air Force base. According to the story, the craft came down over the trees and landed in a blinding explosion of light.

The airmen tried to approach the object, but it moved away from them as though under intelligent control. The following day, landing marks were found on the ground, burns were seen on nearby trees, and radiation traces were recorded. There was even talk of aliens aboard the craft, and allegations of a massive cover-up. It had all the ingredients of a classic UFO encounter.

The *News of the World*'s informant was a former U.S. airman. He was given the pseudonym Art Wallace, for he claimed that his life would be in danger if he talked. Yet here he was freely giving interviews to newspapers and television.

While his fantastic story might be doubted, it was impossible to shrug off a memo written by the deputy base commander, Lt. Col. Charles I. Halt, to the Ministry of Defence, which was publicly released in the United States under the Freedom of Information Act. Halt's memo, reprinted in full here, is not as sensational as Wallace's story, but it is prime documentary evidence of a type rarely encountered in UFO cases.

UFO researchers in Britain could scarcely believe their luck. The *News of*

Ian Ridpath is a well-known science and space writer and a member of the U.K. branch of CSICOP. He is author of several books and editor of the Encyclopedia of Astronomy and Space.

● Colonel's top secret report tells the facts
● Mystery craft in exploding wall of colour
● Animals flee from strange glowing object
UFO LANDS IN SUFFOLK
And that's OFFICIAL
NEWS OF THE WORLD INVESTIGATES
EVIDENCE

the World paid £12,000 for the story. A subsequent book about the case, *Sky Crash*, by UFOlogists Brenda Butler, Dot Street, and Jenny Randles, described it as "unique in the annals of UFO history . . . the world's first officially observed, and officially confirmed, UFO landing and contact." Cable News Network made a documentary about the case.

All that evidence, backed up by the word of the U.S. Air Force, could not possibly have a rational explanation. Or could it?

I have my own detective story about the Rendlesham Forest UFO. Soon after the *News of the World* story appeared, I went in search of local opinions about the case. I made contact by telephone with a forester, Vince Thurkettle, who lives within a mile of the alleged UFO landing site. Immediately I was brought down to earth. "I don't know of anyone around here who believes that anything strange happened that night," he told me.

So what did he think the flashing light was in Rendlesham Forest? I was astonished by his reply. "It's the lighthouse," he said.

That lighthouse lies at Orford Ness on the Suffolk coast, five miles from the forest. Thurkettle plotted on a map the direction in which the airmen reported seeing their flashing UFO, and he found that they had been looking straight into the lighthouse beam.

Could this really be the answer? I visited the site with a camera crew from BBC-TV's "Breakfast Time" program. On the way there, the cameraman indicated that he was skeptical about the lighthouse theory. I didn't blame him.

Colonel Charles Halt's memo on official American Air Force notepaper was headed "Unexplained Lights," dated 13 January 1981, and sent to the RAF. It said:

1. Early in the morning of 27 Dec 80 (approximately 0300 L), two USAF security police patrolmen saw unusual lights outside the back gate at RAF Woodbridge. Thinking an aircraft might have crashed or been forced down, they called for permission to go outside the gate to investigate. The on-duty flight chief responded and allowed three patrolmen to proceed on foot. The individuals reported seeing a strange glowing object in the forest. The object was described as being metallic in appearance and triangular in shape, approximately two to three meters across the base and approximately two meters high. It illuminated the entire forest with a white light. The object itself had a pulsing red light on top and a bank(s) of blue lights underneath. The object was hovering or on legs. As the patrolmen approached the object, it maneuvered through the trees and disappeared. At this time the animals on a nearby farm went into a frenzy. The object was briefly sighted approximately an hour later near the back gate.

2. The next day, three depressions 1½" deep and 7" in diameter were found where the object had been sighted on the ground. The following night (29 Dec 80) the area was checked for radiation. Beta/gamma readings of 0.1 milli-roentgens were recorded with peak readings in the three depressions and near the center of the triangle formed by the depressions. A nearby tree had moderate (.05-.07) readings on the side of the tree toward the depressions.

3. Later in the night a red sun-like light was seen through the trees. It moved about and pulsed. At one point it appeared to throw off glowing particles and then broke into five separate white objects and then disappeared. Immediately thereafter, three star-like objects were noticed in the sky, two objects to the north and one to the south, all of which were about 10 degrees off the horizon. The objects moved rapidly in sharp, angular movements and displayed red, green and blue lights. The objects to the north appeared to be elliptical through an 8-12 power lens. They then turned to full circles. The objects to the north remained in the sky for an hour or more. The object to the south was visible for two or three hours and beamed down a stream of light from time to time. Numerous individuals, including the undersigned, witnessed the activities in paragraphs 2 and 3.

CHARLES I. HALT, Lt Col, USAF
Deputy Base Commander

It was past midnight when Thurkettle took us to the site of the alleged landing, and it felt spooky. The area had by now been cleared of trees as part of normal forest operations, but enough pines remained at the edge of the forest to give us a realistic idea of what the airmen saw that night.

Sure enough, the lighthouse beam seemed to hover only a few feet above ground level, because Rendlesham Forest is higher than the coastline. The light seemed to move around as we moved. And it looked close—only a few hundred yards away among the trees. All this matched the airmen's description of the UFO.

The conclusion was clear. Had a real UFO been present as well as the lighthouse, the airmen should have reported seeing two brilliant flashing

lights among the trees, not one. But they never mentioned the lighthouse, only a pulsating UFO—not surprisingly, since no one expects to come across a lighthouse beam near ground level in a forest.

So startlingly brilliant was the beam that the TV cameras captured it easily. The formerly skeptical cameraman was convinced. My report was shown the following morning on "Breakfast Time," much to the dismay of the UFO spotters and the *News of the World* reporter.

The lighthouse theory soon had its supporters and its detractors. But there were still too many open questions for the case to be considered solved. For instance, what about those landing marks?

Some weeks later I returned to Rendlesham Forest in search of answers. The landing marks had long since been destroyed when the trees were felled, but I now knew an eyewitness who had seen them: Vince Thurkettle. He recalled for me his disappointment with what he saw.

The three depressions were irregular in shape and did not even form a symmetrical triangle. He recognized them as rabbit diggings, several months old and covered with a layer of fallen pine needles. They lay in an area surrounded by 75-foot-tall pine trees planted 10 to 15 feet apart—scarcely the place to land a 20-foot-wide spacecraft.

The "burn marks" on the trees were axe cuts in the bark, made by the foresters themselves as a sign that the trees were ready to be felled. I saw numerous examples in which the pine resin, bubbling into the cut, gives the impression of a burn.

Additional information came from other eyewitnesses—the local police, called to the scene by the Woodbridge air base. The police officers who visited the site reported that they could see no UFO, only the Orford Ness lighthouse. Like Thurkettle, they attributed the landing marks to animals. The case of a landed spaceship was looking very shaky indeed.

What had made the airmen think that something had crashed into the forest in the first place? I already knew from previous UFO cases that a brilliant meteor, a piece of natural debris from space burning up in the atmosphere, could give such an impression. But I was unable to find any record of such a meteor on the morning of December 27.

Here the police account provided a vital lead by showing that Colonel Halt's memo, written two weeks after the event, had got the date of the sighting wrong. It occurred on December 26, not December 27.

With this corrected date, I telephoned Dr. John Mason, who collects reports of such sightings for the British Astronomical Association. He told me that shortly before 3 A.M. on December 26 an exceptionally brilliant meteor, almost as bright as the full moon, had been seen over southern England. Dr. Mason confirmed that this meteor would have been visible to the airmen at Woodbridge as though something were crashing into the forest nearby. The time of the sighting matched that given in Colonel Halt's memo.

Finally, I turned to the question of the radiation readings. I learned that readings like those given in Colonel Halt's memo would be expected from

natural sources of radiation, such as cosmic rays and the earth itself. In short, there was no unusual radiation at the site.

As for the starlike objects mentioned in the final paragraph of Colonel Halt's memo, they were probably just that—stars. Bright celestial objects are the main culprits in UFO sightings and have fooled many experienced observers, including pilots. The object seen by Colonel Halt to the south was almost certainly Sirius, the brightest star in the sky.

If it seems surprising that a colonel in the U.S. Air Force should misidentify a star as a UFO, consider the alternatives. Is it likely that a bright, flashing UFO should hover over southern England for three hours without being spotted by anyone other than a group of excited airmen? And if Colonel Halt really believed that an alien craft had invaded his airspace, why did he not scramble fighters to investigate?

Although UFO hunters will continue to believe that an alien spacecraft landed in Rendlesham Forest that night, I know that the first sighting coincided with the burn-up in the atmosphere of an exceptionally bright meteor and that the airmen who saw the flashing UFO between the pine trees were looking straight at the Orford Ness lighthouse. The rest of the case is a marvelous product of human imagination.

But, somehow, I don't think that my version of the story will make the front page of the *News of the World.*

Postscript. The article above first appeared in the *Guardian,* a respected British daily newspaper, in January 1985. It was written before the U.S. Air Force released a tape recording made by Colonel Halt during his investigations of the "landing marks" and the "radioactivity" in the forest on December 29, 1980. The results of those investigations are referred to in paragraphs 2 and 3 of his memo. I have seen no reason to modify my article in the light of that tape recording.

Since the publication of the article and the release of the Halt tape, Jenny Randles, one of the authors of *Sky Crash* and a leading British UFOlogist, has altered her view of the event significantly. In the November 1985 *MUFON UFO Journal* she writes: "There is nothing on the Halt memo or tape which is inexplicable. Much of it is consistent with the Ian Ridpath lighthouse theory." But she does not accept my explanation. Instead, she now believes that the Halt memo and tape are both part of a coverup for some secret military test or weapons accident. •

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How to Bust a Ghost: Two Quick But Effective Cures

Ridding houses and people of ghosts and demons

Robert A. Baker

AS A PROFESSIONAL psychologist and a longtime student of anomalous behavior I am intrigued by people who see, have seen, or are haunted by ghosts. Over the past decade I have had several clients who have been haunted personally or who have lived in houses or apartments that have been haunted and who have come to me for help with their uncanny problems. During this time and after considerable trial and error I managed to develop two, now routine, standardized procedures for speedily dispatching demons of either person or place. Perhaps the best way to illustrate these methods is to provide a step-by-step review of two recent cases—one of a haunted couple and another of a haunted house.

Haunted People

I received a call from a young man, DF, who asked if I was the doctor who was interested in parapsychology. When I told him I was, he said, "Well, I have an unusual problem and maybe you can help me. It's not just me, it's both me and my wife. We're being haunted by a ghost. I know it sounds crazy but we are bothered by the ghost of my wife's uncle and it's about to drive us both nuts. Could I make an appointment with you as soon as possible?"

Sufficiently intrigued, I set up an appointment for the following day. At the appointed time, only the husband put in an appearance, excusing his wife's absence on the grounds of illness. Following preliminary pleasantries, DF informed me that the ghost was the spirit of his wife's father's dead younger brother. The uncle had been very fond of his niece when she was a

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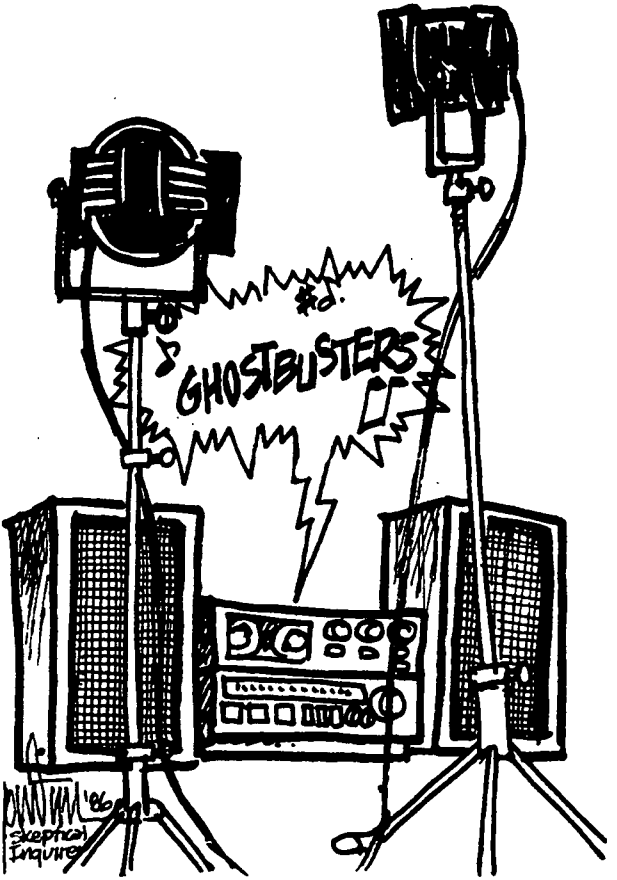

child, frequently visiting, bouncing her on his knee, and bringing her toys. He died at the age of 35, when his niece was 11, and put in his first ghostly appearance when she reached puberty. His first five visitations were made when she was in bed alone. Then he began to appear on occasions of her romantic liaisons with eligible young men. One time the uncle showed up at a petting session in the local lovers' lane. Another time he appeared in front of her boyfriend's car on the way home from a movie. According to the woman, the uncle was clearly and unmistakably jealous of any and all attentions she received from other men. Although the uncle's visitations had tapered off for a while, they became increasingly frequent when she started going steady with her husband-to-be. Moreover, the ghostly appearances intensified following their engagement, culminating in regular and almost nightly hauntings during the honeymoon.

Following their marriage the ghostly uncle would synchronize his visits with the couple's lovemaking activities. During this time DF had never seen the apparition but had relied upon his wife's reports. Approximately a week before his call to me, while making love to his wife, she suddenly exclaimed, "Oh, no! He's here again!" Quickly turning his head, DF caught a glimpse of a man wearing a green sweater (the uncle's favorite haunting garment). Further attempts on DF's part to see him more clearly were futile. They were both understandably distraught and, in DF's words, "We're so nervous now we can't perform. He's ruining our love life!"

At this point in his narration DF suddenly stopped and said, "I feel him here right now. I can always sense his presence even though I can't see him. He's in the room with us right now!"

This gave me a golden opportunity to ply my trade and implement my ghost-breaking techniques. I leaped to my feet, glared viciously at the far wall, and snarled through gritted teeth, "You goddamned stinking, dead son-of-a-bitch, get the hell out of my office and don't ever come back! If I ever catch you in here again or if I ever hear of you bothering this man or his wife again I'll come after you with all the power of Christ behind me and I'll dig up your corpse and drown you in holy water so deep that your soul will rot in hell for a thousand eternities! You have no power here! The power of life and love is infinitely stronger! You can't hurt these people and it will do you no good to bother them any further! From now on they're going to ignore you. You have had it, you ghostly bastard! So get lost and stay lost!"

DF gaped at me in pure astonishment, his mouth hanging open. "Do you still feel his presence?" I asked.

"Oh no. He's gone." DF replied.

"That's right," I followed, "And if he knows what's good for him he'll stay gone. The way to handle Uncle G. from now on," I stressed, "is to threaten him. The only way that he has power over you is for you to fear him. As long as you and your wife continue to be afraid of him he will continue to haunt you. He has the power to plague you only as long as you are afraid of him. Once you show him that you're not afraid of him, all his power is gone. You and your wife were afraid of him weren't you?"

"Yes," DF replied, "We were. The wife more so than I was because she's the one that kept seeing him all the time."

"Well, if he ever shows up again and if either of you ever see him again, I want you both to stare him straight in the eye and give him hell. Say, 'I'm not afraid of you. You are dead, dead, dead, and the dead have no power over the living. So you might as well get the hell out of here and stop bothering us.' Has your wife ever looked him in the eye?" I asked.

"No," DF said, "We've been told that if you look a ghost in the eye it'll steal your soul."

"Baloney," I rejoined. "That's simply nonsense, an old wives tale. In fact, the opposite is true. What ghosts and spirits are most afraid of is your lack of fear. There's an old Irish legend that says, 'If a ghost is chasing you it will

continue to pursue you as long as you run.' If you stop and face it, it will go away. All ghosts feed on fear, and if you show them you're not afraid they dry up and blow away."

"Didn't you feel his presence a few minutes ago?" DF asked.

"No. I did not, and I couldn't see him either. Your ghost is not out there in the environment somewhere. Uncle G. is inside your head and inside your wife's head. This doesn't mean he's not real. As far as you two are concerned he is real. You're not crazy or anything like that. It's just that he's not haunting me, he's haunting you two. And, since I don't know him, never heard of him, don't give a damn about him, and, God knows, certainly don't fear him, he has no power over me in any shape, form, or fashion. But I have power over him and any and all ghosts, because I know and understand them and how they operate. So, from now on, don't you let him threaten you. You threaten him instead! Okay?"

"All right. He sure went away as soon as you hollered at him," DF agreed.

"Certainly he did. Of course." I replied, "And I doubt very seriously that he'll ever show up again. If he does, you now know what to do. Stare him right in the eye and tell him to get the hell out of your life. If he doesn't disappear instantly, call me, and I'll finish him off completely, totally, and once and for all! Now, since it is your wife that has had the most trouble with him, it is particularly important that she do exactly as I have said. Make sure that the next time he shows up she gets very, very angry and screams and throws things at him and that she looks him straight in the eye and tells him he has no power over her and that it will do him no good to ever bother her again. If you are there with her and you sense his presence—even though you don't see him—you also threaten him. Okay?"

With this, DF rose, thanked me, assured me that both he and his wife would follow my prescription, and left.

Eighteen months have elapsed and, so far, Uncle G. has stayed away. I confidently predict he will never be seen again by either DF or his wife. The Freudian implications of the wife's sexual problems with the uncle aside, quite clearly guilt and childhood traumas are involved in the apparition's appearances. Nevertheless, superstitious fear is the source of the problem and is most likely responsible for the persistent manifestations. Both husband and wife felt a sense of helplessness and needed to be given a source of power and an effective (in their eyes) means of dealing with the periodic irritations. Once they are able to cope, their major problem disappears. This is not to argue that all of the wife's deeper conflicts and sexual hangups have been resolved. It is doubtful that they have, but at least she now has a tool—an effective way to fight, a weapon for dealing with her externalized fears.

Haunted Places

The poorly kept secret of dealing with spirits—particularly evil or scary

ones—is to fight fear with fear. This principle is well known to all witch-doctors, medicine men, and shamans, from Timor to Tibet. The horrible masks, the horns, the dragons, the firecrackers, the loud screams and screeches—all are designed to frighten the evil spirits away. For de-haunting houses my twenty-first-century equivalents are hi-fi equipment and electronics. As soon as you are informed of the whereabouts of said wraith, assemble as many speakers as you can afford and as brilliant a light show as is available and then to go work. The procedure is somewhat analogous to fumigating, except your purgatives are light and sound rather than toxic gases.

My last house-clearing consisted of an unusually irksome couple of elderly apparitions who kept showing up at odd moments—usually after dark—standing quietly at the foot of family members' beds or lurking in the hallway or peering down from the head of the stairs. Family members described the transparent two as being over 60 years old, tall and gaunt, sickly looking and hollow-eyed. Both wraiths were wearing turn-of-the-century garments. Their haunting habits also included some occasional moans and groans in the wee hours of the morning, most noticeable when the wind blew from a certain northerly direction. Since the domicile was a single-family, two-story frame house set at the edge of town, some of the difficulties encountered with apartment ghosts were avoided.

On the appointed evening the hauntees vacated the premises and spent the night with friends and relatives. Using two 1,000-watt Pioneer portable speakers and a Realistic STA-860 high-power amplifier with a tape deck and a variety of tapes featuring hard-rock bands, e.g., *Rait, Billy Idol,* and *Devo,* supported by a portable 7¾-inch Xenon super-strobe light capable of illuminating a 60-by-90-foot area, I was in the house shortly after dark. The strobe light, when set to flicker at 10 to 12 flashes a second, is particularly disconcerting to all spirits—both living and dead. After equipping myself with ear plugs and sunglasses, the tapes were played at maximum volume while the strobe was systematically flashed in every room and hallway—including closets, basement, and attic—of the entire house for a two-hour period. Paradoxically, thunderous hard-rock sound instead of raising the dead actually drives them away. It is also most effective in repelling senior citizens.

To ensure maximum results, all of the haunted family members must be present for the first few minutes of the de-haunting procedure. They are required to feel the full effects of both light and sound in order to appreciate what the unfortunate ghosts are having to endure. Once the hauntees are safely away from the premises, it is permissible for the ghostbuster to terminate the light and sound after a few minutes, provided of course that there is no chance of the hauntees returning unexpectedly and prematurely. They must leave with the firm conviction that the flashing cacophony will continue till dawn.

These procedures were sufficient to cause a cessation of visits from the incorporeal codgers, and, when some needed repairs were made to the cornices and soffits of the house, the moaning and groaning of the northwesterly

winds also ceased.

The de-ghosting of apartments and condominiums, expectedly, is a little more tricky. For these you must consider both neighbors and local police, especially if you use tapes featuring machine-gun and artillery fire, thunderstorms, steam whistles, and sirens. These, I have learned, are most effective for the more persistent geists—*polter,* quiet, or what have you. These realistic sounds are highly recommended for crowded or densely populated areas, because the use of the hard-rock tapes will often attract hordes of teenagers who will mistake your efforts for a party. No spirit in his right ectoplasm is able to withstand this realistic sort of auditory onslaught for long. In fact very few of the living or the dead, haunter or hauntee, can tolerate it for more than a few minutes. For this reason and to avoid angry confrontations with neighbors and police, a reduction in volume is advisable.

For caves, cemeteries, and older rural domiciles—places minus the benefits of rural electrification services—portable generators may be required to power your electronic torches, bones, and gourds. While many busters urge the wearing of masks and other sorts of Halloween grotesqueries, I have never found such supplementary aids necessary. Yet the possibility exists that some particularly stubborn ghoulies who are both near-sighted and hard-of-hearing may require this added inspiration before yielding the premises to more substantial mortals. In such an event the wearing of masks and the liberal sprinkling of holy water,* dispensed from a cross-marked container, should suffice.

No other special techniques or precise methods of application are required. This is, I am aware, a sharp divergence from the more traditional methods of exorcists. Nevertheless, what I recommend here is equally efficient, if not more so. I do, however, urge the use of an assistant when de-haunting houses. At least two people are required to load, unload, set up, and arrange the noise-and-light show. Also, the more slamming and banging the better, and experience has shown that two busters are twice as noisy as one. A second all-night session may be required to bust a ghost-ridden residence, but very rarely. In the event it is necessary make sure the home dwellers remain on the premises and you keep up the cacophony for at least three or four hours. Most residents will then be so happy to see you go that the ghost itself becomes a minor problem; certainly something considerably quieter and less spectacular. If any specter has ever returned to houses I have bombarded with sound and light, I have yet to hear it from those who were haunted.

As difficult as it may be to believe, a recent Gallup poll revealed that 72 percent of the sampled public professed to a belief in ghosts and more than 40 percent insisted they had seen one. However, the promulgation of these simple confrontational and fear-foiling procedures should result in a decline

* Tap water drawn from the nearest faucet. If the client is suspicious, draw it from a church and have it blessed by a priest. If a priest isn't handy, bless it yourself, but don't let your client know.

in the manifestation of all such ghosties, ghoulies, and things-that-go-bump-in-the-night. In time, the wider application of reason, courage, and common sense may also lead to a lessening of the power superstition still holds over the mind of space-age man. •

Expansion of Local Groups

The growth of local groups is one of the most pleasing aspects of CSICOP. Such organizations undertake investigations at the local level, gain media coverage, hold meetings and social functions, and some publish newsletters. See page 112 for a current listing of local autonomous groups with aims similar to CSICOP's and of CSICOP branches in other countries.

If you live in one of these states or countries and are not involved with the local group and want to become involved, please complete and send the form below directly to the group in your area. If you do *not* live in one of these states or countries and would like to be involved in the formation of a new local organization, please complete the form and send it to Barry Karr/Mark Plummer, CSICOP, Box 229, Buffalo, NY 14215-0229.

Name _____

Address _____

City _____

State/Country _____ Zip/Postal Code _____

Phone: (home) _____ (office) _____

Occupation _____

Interests/Background/Expertise _____

_____

If a local group was formed would you like to be:

☐ Organizer

☐ Group member

☐ Newsletter editor

☐ Consultant: Special area(s) _____

☐ *Supporter*

Past/Present

Past/Present is a feature that appears from time to time in the SKEPTICAL INQUIRER. This the first of occasional columns in which an informed scholar or investigator responds to a question, usually based on inquiries from readers, about the status of a particular claim or research topic.

Maimonides Dream-Telepathy Experiments

What is the status of the dream-telepathy experiments that were carried out at Maimonides Hospital in New York many years ago?

Ray Hyman

THE PARAPSYCHOLOGICAL version of the Maimonides experiments was presented in the popularly oriented book *Dream Telepathy*, by Montague Ullman and Stanley Krippner (Baltimore: Penguin, 1973). C. E. M. Hansel, in his *ESP and Parapsychology: A Critical Re-evaluation* (Buffalo, N.Y.: Prometheus Books, 1980), provides a detailed description of these experiments and the attempted replications from a skeptic's viewpoint. Hansel concludes that when attempted replications use rigorous controls they produce only chance results, even when using subjects who were successful in previous experiments.

The dream-telepathy experiments follow the same pattern that characterizes other allegedly successful parapsychological research programs. The early experiments appeared to produce striking and significant successes. Attempts by neutral parties to replicate the results fail.

The accompanying story is also typical. The parapsychologists, and even the experimenters who failed to replicate the initial results, agree that replication attempts failed because the use of tight controls created a formal atmosphere that inhibited

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the previously successful subject. The cynics, on the other hand, argue that the initial experiments had loopholes that probably created the false impression that ESP was taking place.

Today, no parapsychologist does experiments on dream telepathy. Like previously "successful" research programs, the dream-telepathy project has been abandoned. The parapsychologists say that the reason for this is that these experiments require too much effort and equipment and are too costly. Instead, they have found easier and less expensive ways to induce an altered state, such as relaxation, hypnosis, and the ganzfeld technique. They claim that experiments using these simpler procedures produce results that are just as good as those from the dream research.

Critics, I among them, believe that dream research did not survive because it no longer produced results. And careful evaluation of the contemporary research by Chuck Akers and myself suggests that none of the current research that allegedly yields "successful" results can pass muster on methodological grounds.

The situation is peculiar in a number of ways. Most of the critics of parapsychology do not have first-hand knowledge of the best research going on in the field. Many of the parapsychologists have been well trained in one of the sciences, such as biology, physics, or psychology. They have earned legitimate Ph.D.'s and know how to produce appropriately controlled and analyzed experiments. A fair and honest review of their reports indicates that they are more sophisticated and "scientific" than many of their critics give them credit for.

Yet something is definitely amiss. Each generation puts forth its share of "successful" research programs. But each generation ignores the claimed "successes" of the preceding generations of parapsychologists. The field thus lacks continuity and cumulativeness. Something peculiar, in my opinion, is going on. But I do not believe it has anything to do with PK or ESP. Rather, I think it will turn out that there are subtle and previously unknown ways that humans, no matter how sincere and dedicated, can become convinced of things that are not so.

An article reviewing and defending the Maimonides research recently appeared in the *American Psychologist* (November 1985, pp. 1219-1229). The author, Professor Irvin Child, is a psychologist at Yale University and a parapsychologist. Professor Child, whom I consider to be one of the more respectable parapsychologists, argues that Hansel and other critics have misrepresented the facts about the dream-telepathy experiments. He argues that a fair evaluation of the results would justify the claim that an anomaly of some sort has been demonstrated. Although I think Dr. Child makes some good points, I believe that the fact that the only known attempts to replicate the Maimonides research have either failed or provided questionable results justifies scientific caution in taking the original results seriously. •

Book Reviews

Dissecting Claims, Exploring Self-Delusion

Science Confronts the Paranormal. Edited by Kendrick Frazier. Prometheus Books, Buffalo, N.Y., 1986, xiv + 367 pp. $15.95 paper.

J. W. Grove

THERE SEEMS to be no limit to the capacity of our species for self-deception and wishful thinking; and, if the cognitive psychologists are right, many people will continue in those states even in the face of persuasive evidence that they are wrong to do so. For example, in an experiment with college psychology students (described in this book), 30 out of 52 refused to accept that a magician was not psychic even after the class had been firmly told that what they were about to witness would be the result of trickery. This makes one wonder whether "skeptical inquirers" are wasting their time. As a rationalist, I cannot give way to such pessimism, but the evidence is clear that the forces of reason are still engaged in an uphill battle.

Science Confronts the Paranormal is an excellent collection of articles that appeared in the SKEPTICAL INQUIRER between 1981 and 1985, and there is much that the lay person can learn from it. The standard of critical argument is high, a fact that should be recognized even by those who will find the conclusions unpalatable. The contributors include astronomers, psychologists, chemists, physicists, anthropologists, engineers, science writers, philosophers, two professional magicians, a geologist, an optometrist (who provides an analysis of iridology, a dangerous and bogus pseudo-diagnostic technique now used by some practitioners of "alternative medicine"), and a mathematician-polymath. A large part of the book is devoted to essays on parapsychology and the dissection of alleged instances of psychic phenomena; and rightly so, since psi is currently in the forefront of debate concerning the demarcation between science and pseudoscience. There are several useful articles on general topics, including coincidence, the sources of misperception, and hypnosis as a means of eliciting the truth. Others dissect, in sometimes fascinating detail, palmistry, astrology, lunar effects, the great UFO coverup, "cult" archaeology, and

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the Turin shroud. There is even a brief reference to the satanic messages that are audible when pop records are played backward. In this connection, I note a recently published book by Ruth Montgomery—"the world's leading psychic authority," according to her publisher (Doubleday)—which reveals that "the Anti-Christ is among us now, currently living as an American teenager." The creationists' Paluxy Footprints are revisited and the Loch Ness monster is reassessed. Regrettably, no mention is made of the Chinese monster that is reported to like corn on the cob, nor of the "lost" Stone-Age tribe of Mindanao, which turned out to be a hoax engineered by one of former President Marcos's henchmen. Since it is clearly impossible, in a short review, to do justice to all this richness, I shall focus on a few of the issues that interested me most.

Why this seemingly insatiable fascination with the paranormal in a society that is permeated by science and technology? I say "fascination with" rather than "belief in," because (as the editor, Kendrick Frazier, points out) opinion surveys rarely gauge the strength and depth of belief. Can it, for example, be true (p. x) that 69 percent of a sample of American teenagers surveyed by Gallup in 1984 actually *believed* in the existence of angels? Where is the line between believing and thinking something possible? Interest in the paranormal is notoriously fostered and manipulated by the media, by movie-makers, and by publishing houses (I have already given one example of that), and played upon by the unscrupulous for their own ends, but none of this would be possible if there were no demand to be satisfied. (James Randi provides a splendid example of media manipulation in his account of the Columbus, Ohio, poltergeist—pp. 145-157.)

Frazier suggests that the public's interest in the paranormal stems in part from our curiosity and sense of wonder (but so does science) and in part from the understandable human need for comforting beliefs. We would like to "know our fate" (hence astrology and palmistry); we are aware of our own mortality (and therefore we hope for life after death); we are beset by earthly problems that seem insoluble (thus many of us at least are sure to welcome Ms. Montgomery's assurance that a shift in the earth's axis, which will take place before the year 2000, will "cleanse the earth of pollution and evil"). Yet I suspect that there are more mundane reasons as well for the "paranormal turn" in contemporary society. One of these may well be the same populist mistrust of experts (scientists and technologists) that is manifest in other areas of modern life. One is constantly struck by the amateurish quality of the work of pro-paranormal writers and investigators and the trivial nature of the events they describe. The paranormal tends to be commonplace; the happenings can be easily grasped. And that is its strength. Children bend spoons by psychokinesis; the Enfield poltergeist shouts out obscenities and writes "I am Fred" on the bathroom door; the homely looking Soviet psychic levitates ping-pong balls; and Targ and Puthoff's "subjects" are asked to "remotely view" shopping plazas (moreover, Targ and Puthoff tell us that anyone can be a psychic). These are familiar things, and they are done by, or happen to, ordinary people.

But that is not, of course, the whole story. Many mysteries are unexplained. Even allowing for the well-documented eccentricities of the English upper classes, one may legitimately ask how could it come about that members of the aristocracy and landed gentry, the wife of a Member of Parliament, and an Anglican bishop (even one who, according to the *New York Times*, "shuns ecclesiastical vestments and worships in a converted pig-sty") could join with a pious parish priest to raise in excess of $300,000 to support a convicted felon in "his struggle to free himself from a Satanic cult headed by the deputy prime minister." (The cult was his own invention, and he spent

the cash on call-girls "and a life of dissipation," facts that emerged in his trial in 1986 on nineteen counts of fraud.) How, also, is it possible for a Nobel Prize-winning physicist to go on public record in support of the unsubstantiated claims of "a French medium" (actually a former conjurer) to have produced substantial changes in the properties of metal bars by psychokinesis and the claims of Targ and Puthoff to have produced definitive evidence for remote viewing (successfully countered by Marks and Kammann, one of whom contributes further on the subject in this volume)? Or consider a well-known reviewer of Hansel's *ESP and Parapsychology* (*Times Literary Supplement*, July 25, 1980, p. 854) who dismisses modern parapsychology on the ground that it is not only trivial but is a betrayal of the original aims of psychic research, adding:

> It is worth asking why the laboratory experiments were undertaken in the first place. And the answer is clear. Their purpose was to test and clarify . . . a large mass of evidence for telepathy, clairvoyance and precognition derived from ordinary experience.

And later:

> Leaving the question of survival [after death] on one side . . . the phenomena of the séance-room must then be seen as providing some of the most striking examples of telepathy among the living.

"Large mass of evidence"? "Some of the most striking examples of telepathy"?

An important ethical issue raised by Martin Gardner, in one of the four chapters he contributes to this book, concerns the use of deception by investigators of paranormal claims. He specifically cites the case of James Randi's Project Alpha. (This project is discussed by Randi himself on pp. 158-165.) Gardner makes a vigorous case for its use. There is something rather distasteful about entrapment; yet it may be the only way of arriving at the truth. There is a vicious circle here. Psi researchers are notoriously reluctant to release their raw data, or even to discuss their techniques with outsiders; and they tend to be defensive about the negative results of experiments that attempt to replicate their results, on the ground that these are done by people solely interested in destroying their credibility as competent researchers. This lack of mutual trust makes access and openness exceedingly difficult to secure. One has, of course, to be cautious about the importance of replication. As Piet Hein Hoebens points out (p. 31), "In mainstream science opinions wildly differ as to the level of replicability required for academic respectability, whereas history has shown examples of perfectly repeatable observations based on collective misconceptions." For example, N-rays? But this is not all. Some experiments in science are nonrepeatable; many experiments are never repeated; and some are thought not worth repeating. Nevertheless, *some* experiments (and observations) *are* repeated, where they are thought to be crucial or especially important.

The problem with psi research, it seems to me, is that the system is not self-policing; it is insufficiently critical of its methods and results. But if outsiders are to do the job for them, should they be magicians or scientists? Gardner discusses this in another paper (pp. 170-175), but only in relation to possible fraud. Clearly, not all psi-researchers and their subjects are dishonest, though they may be misguided. Where fraud is suspected, however, I am sure Gardner is right. What Gardner calls "close-up magicians" (as against stage performers, who rely on ingenious apparatus for their effects—which most psychic frauds do not) are, he says, vastly superior to

scientists—indeed to anyone without a background in magic—in the detection of fraud. The reasons scientists are unlikely to be of much use seem to me to be obvious. Scientists work in an environment (and a culture) in which fraud is, in principle, ruled out. It is not the aim of science to make false statements about the world. There are, of course, well-attested instances of fraud in science, and it may be that these are becoming more frequent. But they tend to arise from sociopolitical cases in recent times that are clearly due to contemporary pressures of competition and to the demands of a funding system that often favors quick and "dirty" results.

The last issue on which I wish to touch is that of demarcation between science and nonscience. This question is briefly, and I think unsatisfactorily, addressed here by the philosopher Stephen Toulmin. The prevailing trend in philosophy of science, in the writing of history of science, and in the sociology of scientific knowledge is to reject the possibility of establishing any rational criteria by which science can be distinguished from pseudoscience, or indeed what is "normal" from what is "paranormal." What is to be considered "scientific" and what to be "normal" are seen as matters of occasion, of historical context, determined by processes of negotiation that reflect both the social and general intellectual milieu of the age and the differential power relations that exist at any time between various bodies of practitioners.

In the words of Trevor Pinch and Harry Collins (who are briefly mentioned in this book): "Our concepts of the natural world emerge from the artful construction and negotiation of scientific knowledge" (*Social Studies of Science,* 14, no. 4, 1984). I have discussed the work of the social constructivists (as they call themselves) elsewhere (*Minerva,* 20, nos. 3-4, 1982, and 21, no. 4, 1983) and there is neither space nor need to repeat my criticisms here. I reject (among many other things) the relativism of their contention that *any* body of knowledge claims is on a par with any other (which entails that there can be no objective truth or falsity). So does Toulmin (or so he says). Yet he also says (p. 14) that the idea that scientists should pay attention to the quality and quantity of the evidence, to the strength of the support it gives to their theories, and to the observations that might conceivably falsify them, is now recognized as "so much apple pie." This extraordinary statement shows how far contemporary philosophy of science is moving away from its proper function; indeed, how fast it is becoming a major intellectual scandal. As to the sociologists, they are doing interesting work unraveling what goes on inside laboratories and observatories in the practice of science; but they should stick to what they are trained to do and leave epistemology alone. •

A Critical Guide to Parapsychology

A Skeptic's Handbook of Parapsychology. Edited by Paul Kurtz. Prometheus Books, Buffalo, N.Y., 1985. 727 pp. Index. Cloth $34.95. Paper $16.95.

Susan Blackmore

WHEN YOU BUY *A Skeptic's Handbook of Parapsychology,* don't just leave it standing impressively on its shelf "for reference." It is certainly a big and weighty book; more than 700 pages, including thirty chapters, by psychologists, philosophers, sociologists, statisticians, magicians, and professional parapsychologists. But it is not dull. I even found myself keeping my copy by my bed! Many of the chapters are eminently readable, and the whole book provides a fascinating, if necessarily one-sided, insight into the problems of parapsychology.

The book is in six sections, starting with historical overviews. The very first chapter, by Ray Hyman, is undoubtedly the best. With examples from every period of psychical research, he shows how both the proponents of the paranormal, and their critics, have fallen prey to a False Dichotomy; when an investigator concludes that some phenomenon is real then everyone assumes that either his conclusion is justified or he is incompetent, gullible, or deficient in some other way. Hyman's argument is that there are many more alternatives and that a far higher standard of criticism is needed to explore them. He also suggests that many parapsychologists have probably assumed that their database was of much higher quality than it actually was, until recent more constructive criticisms were made—and Hyman's meticulous criticisms have certainly given me some unpleasant surprises.

Next, the well-known critic C. E. M. Hansel discusses the search for a demonstration of ESP, selecting a few important experiments, such as Sargent's recent ganzfeld research, and listing numerous weaknesses—some valid and some certainly not—in their designs. He concludes that in 100 years of research there have been a high incidence of trickery and a long history of inept (and not improving) experimentation; no repeatable demonstration has been forthcoming, and results have been reported and confirmed at low levels of confidence. Edward and Ellen Girden discuss fifty years of research into psychokinesis, or PK; coming to the Scottish verdict of "not proven."

I especially enjoyed two reprinted articles. Simon Newcomb, first president of the American Society for Psychical Research, wrote "Modern Occultism" in 1909. In response to the spiritualistic beliefs of eminent men like Sir Oliver Lodge and Professor William Barrett, Newcomb showed how people can form erroneous beliefs and be misled by coincidences; how memory can distort events; and how stories grow from nothing. His comments on the problem of unrepeatability are uncannily relevant nearly 80 years later, and it is rather disturbing to see how long people have been making the same points with apparently no effect. His final comment concerning research into thought-transference might have been made by most of the contributors writing today: "Possibly you may succeed, but the more pains you take to avoid all

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sources of error, the less likely success will be" (p. 153).

Writing little more than 15 years ago, another veteran of psychical research, Eric Dingwall, gives an outrageously skeptical view of his 60 years in the subject. He has some delightful tales of deception and ineptitude to tell and states his conclusions more bluntly than most. "I no longer believe the stories I read" (p. 162), he says. "I do not intend to waste any more time over the hoaxes and fictional reports put out by parapsychologists" (p. 174).

Part 2 deals with the argument from fraud, an issue that recurs throughout the book. Here Paul Kurtz begins with cases of fraud among spiritualists, mediums, and psychics. Included are discussions of the Fox sisters, D. D. Home, Eusapia Palladino, and Uri Geller. Kurtz discusses how easily scientists have been, and still are, deceived.

Coover's 1927 article on the same topic is reprinted, with marvelous accounts of the feats of early mediums and the totally contradictory descriptions that honest observers gave of the same events. He also tackles the claim (heard often enough even today) that D. D. Home was never publicly caught cheating. Maybe not, but the firsthand accounts given here of séances with Home suggest that his unmasking came terribly close.

Two fascinating "confessions" are included. First there is Margaret Fox's 1888 explanation of how she and her sisters learned to click their toe joints to produce the raps upon which spiritualism was founded. What began as a childish prank soon got out of control and in the end, so Margaret suggests, ruined their own lives and deceived many others. I have read numerous arguments that this confession should be ignored, but to me Margaret's words have more than the ring of truth—they make the whole sad story plausible.

Second is the confession of Douglas Blackburn, whose experiments with G. A. Smith convinced many early psychical researchers of telepathy even though the results were, according to Blackburn writing in 1911, dependent on the use of codes. These heartfelt confessions show how easily even children can deceive their elders; how much pressure can be put on them by the will to believe of some investigators; and finally how very difficult it is for them to undo the deception, even with the best intentions. Some similar accounts are given in J. Fraser Nicol's discussion of fraudulent children in psychical research; and there is an account of the haunting of Borley Rectory by Trevor Hall.

The rather different issue of fraud by experimenters is dealt with in Betty Markwick's account of the establishment of data manipulation in the Soal-Shackleton experiments and in D. Scott Rogo's account of J. B. Rhine and the Levy scandal. The two are totally different. Markwick painstakingly recounts the entire fascinating story of the 30 years it took to get to the bottom of Soal's "success." She details the early speculations and the hard work and false leads involved in checking them, and the resistance of many parapsychologists to admitting that Soal cheated, until the final, overwhelming evidence was collected by Markwick herself. This, for me, raises a real problem for parapsychology. If it can take 30 years and persistent hard work to discredit one fraudulent researcher, the advantage remains always with the proponent.

By contrast, Rogo's chapter, though also a fascinating story, depends heavily on gossip and hearsay. He recounts how Rhine's most promising star researcher was suspected of fraud and finally caught red-handed. The story does not reflect well on Rhine's handling of the case, nor on the way he put constant pressure on his researchers to produce significant results; and it shows up the totally inadequate precautions taken at Rhine's laboratory during the early 1970s. Nevertheless, one is

hard pushed to know how much is agreed fact and how much Rogo's speculation.

The section on fraud ends with two chapters on magicians, conjurers, and psi. James Randi is typically entertaining but is quite unfair in treating all parapsychologists as some kind of unitary breed to be laughed at. However, he certainly makes his case that expert advice from conjurers is freely available and that scientists should not feel it a reflection on their competence to admit that they need it. Martin Gardner's article on this issue specifically criticizes one by Harry Collins from *New Scientist;* it would have been more interesting if Collins's original article had also been reprinted.

Part 3 is misleadingly entitled "Parapsychologists Reply." I say it is misleading not because the authors (Beloff, Stokes, Blackmore, and Hövelmann) aren't parapsychologists but because I can see no need for separating them out in this way when there are plenty of other parapsychologists writing elsewhere in the book; and because none of these papers was ever intended as a reply." They would have been far better included elsewhere and perhaps some real "replies" solicited.

John Beloff begins by asking "What is your counter-explanation? A plea to skeptics to think again." He suggests that whenever we are confronted with a paranormal claim we should ask ourselves what normal explanation would suffice to account for the evidence and then ask whether this is more or less plausible than the original paranormal claim. Naturally this will vary with one's prior beliefs but will, Beloff argues, at least sharpen the controversy. To my surprise he uses Eusapia Palladino as an example and left me (after reading the rest of this book too) *almost* convinced that a normal explanation would do. However, I take his point that both options are open and rational and that, for him, the believer's position requires less intellectual contortion.

Douglas Stokes next discusses parapsychology and its critics. His review of the literature is heavy going and necessarily too brief to stand as anything other than a personal selection. But I liked his discussion of the ways in which people try to avoid the cognitive dissonance evoked by both belief and disbelief in psi. He also made the point that parapsychology may be becoming methodologically isolated from the rest of science, which would finally render it a true pseudoscience rather than the protoscience it claims to be.

In my own chapter, "The Adventures of a Psi-Inhibitory Experimenter," I outlined the ten years of negative research in parapsychology that led me to face up to the problem of unrepeatability, and the stagnant research program that the psi hypothesis has generated. I suggested that parapsychology could solve most of its problems by abandoning the psi hypothesis in favor of concentrating on the phenomena themselves.

This section closes with an annotated bibliography of skeptical literature on parapsychology by Gerd Hövelmann with some additional comments by Hyman. In its concise introduction Hövelmann points out the wide range of types of skepticism and the inadequacy of dividing people into two camps. It is then particularly irritating to find the chapter given a kind of editorial disclaimer in which everyone is identified as either in one camp or the other, or both! I found the bibliography especially useful in giving not only important books and articles, but all the reviews, criticisms, and responses to them, which often go unnoticed.

Part 4 is called "Parapsychology: Science or Pseudoscience." First Christopher Scott explains why, in his opinion, parapsychology demands a skeptical response: because of nonrepeatability, the absence of any properties for psi, and the correlation between results and the experimenter—all of which seem to suggest that parapsy-

chologists are mystery mongers rather than problem solvers. But Scott is most unfair in his criticism (which he has made before and been challenged on before) that parapsychologists do not investigate the modus operandi of psi. They do. They call it process-oriented research, and even in this volume it is frequently mentioned. The lack of progress is certainly not for want of trying!

Paul Kurtz next asks the problematic question, "Is parapsychology a science?" By implication his answer is no, but largely on the grounds of unrepeatability—a problem long recognized within parapsychology and to which he contributes little that is new. He constantly divides people into skeptics and believers and seems to assume that all parapsychologists believe in psi and that all believers are dualists, which does nothing to clarify the question. In the end, I fear he fails to answer it.

Antony Flew tackles much the same question, starting with the important point that parapsychology is nothing like other obvious pseudosciences with which CSICOP has to deal. By contrast, it does make a case to answer. However, until there is a repeatable experiment, parapsychology will at best be preparing for some future "science."

James Alcock discusses parapsychology as a "spiritual" science. He makes two thought-provoking points: first, that the driving force behind the research has always been a spiritual quest rather than one motivated by anomalous observations occurring in normal science. Physicists who find anomalies never turn to parapsychologists for help! Second, he traces the urge to understand human spiritual potential and shows how parapsychology has totally failed to fulfill it.

Part 5 considers methodological and theoretical issues. Refreshingly, Persi Diaconis begins by pointing out that skeptics also make mistakes! He describes several experiments he witnessed at firsthand and shows how difficult it is to judge experiments from their written accounts: The problems are uncovered only by people who actually watch them, and of course one cannot watch every experiment. Denys Parsons describes some "detective work in parapsychology," giving examples in which his persistence, writing numerous letters, and visiting people and places finally allowed the "mysteries" to be solved. The work involved is skilled and tedious, and most laymen do not know how to do it.

Martin Gardner's chapter helps dispel some of the mystification of quantum mechanics and psi. He analyzes Evan Harris Walker's theories of psi, explaining exactly where Walker takes great leaps from accepted physical principles. He says, "To readers unfamiliar with QM, Walker's papers seem enormously impressive because they swarm with equations and scientific jargon that only a physicist could understand. But when it is all translated and you discover exactly what he is saying, his 'theory' turns out to be only a collection of pious hopes" (p. 594).

Charles Akers asks, "Can meta-analysis resolve the ESP controversy?" This is a genuinely helpful contribution for people struggling to understand the techniques of evaluating whole research areas or to be fair to the conclusions of (for example) Hyman and Honorton over the ganzfeld controversy. He explores the value of meta-analysis and details its limitations, especially when it is applied to old data over which there is irresoluble disagreement. He concludes that attention should shift toward designing better experiments whose results should then be amenable to meta-analysis.

The last part includes three further critiques. Piet Hein Hoebens reflects on psychic sleuths. He gives many examples of spectacular claims that psychics helped the police by ESP, all of which later succumbed to normal explanations. He adds that, contrary to what many skeptics believe, there are several unexplained cases,

and many police who are satisfied with the psychics' help.

Hövelmann next considers the evidence for survival from near-death experiences. After a thorough review of the literature, he lists various nonsurvivalist explanations. While arguing that the survivalists have failed to provide a good case, he emphasizes the importance of studying the experiences themselves.

Finally, Leonard Zusne contrasts magical and scientific thinking, tracing the development of both types of thought in children and adults and concluding that parapsychology is largely based on magical thinking. However, he seems to imply that all science is truly rational and all parapsychology "magical." He also ignores the parapsychologists who make genuine attempts to apply scientific rationality to apparently paranormal events.

It is impossible to review this enormous book as a whole, but it is worth considering some recurring themes. One is the way in which people have been motivated by a quest for spiritual understanding. In many different ways we see how psychical research and parapsychology have sprung from a belief in dualism, a search for the afterlife, or an honest desire to make a science of man's spiritual nature. In all these quests parapsychology has sadly failed, and this book clearly shows how. But Alcock is almost alone in respecting the quest, even while criticizing its results so far. One day we may well have a spiritual science and come far closer to understanding human nature than we are today, and skeptics could lead the way rather than scoffing at the ideal!

Another recurring theme is the human tendency to be certain one is right and to want to give the final word on everything. Here we have what seem to be "final words" on Borley, remote viewing, the Levy scandal, and much more. Only Markwick's analysis of the Soal case really comes even close. And really this book should be able to teach us that there will never be final words on most of these stories. There will always be people who choose to believe—against all odds—in some fanciful explanation, and people who wish to prove them wrong.

There are also the recurrent problems, such as fraud, which will always be with us. Several of the contributions help us to understand how and why people cheat and how readily their deceptions are encouraged, but they do not help us to eradicate fraud in the future. Then there is the problem of repeatability, recognized since the beginning of psychical research and still agonized over today.

I suppose it all amounts to the fact that little has changed in such a very long time. One of the things I liked best about this book was the reprints of early articles alongside the modern ones. Sixty years ago Coover exposed the "fagot theory" as fallacious and yet Hyman, today, has to point it out again, with respect to Honorton's accumulation of lots of individually flawed experiments. Coover even comes close to Hyman's "False Dichotomy" when he says, "An eminent scientist may be wrong in his observations, even repeatedly wrong, as Crookes certainly was, without being 'either a knave or a fool' " (p. 264); and from a different perspective James Randi makes a similar point with respect to conjuring. People who think they are intelligent, well-educated, and good observers believe that anything they cannot understand must be supernatural.

So nothing much has changed. And we should ask ourselves why. Is it because parapsychologists are "knaves or fools," because the critics are unfair, or because the problem is too intractable? I don't know. I can only suggest that the best lesson we can learn from this book is that we need much better skeptical approaches. Here many of the contributors would agree with me; though some seem hopeful that such progress is already with us, others are more pessimistic. However, this book must be

a step in the right direction. It is totally biased against belief in psi, but then it doesn't proclaim anything else; and after all B. B. Wolman's *Handbook of Parapsychology* (Van Nostrand Reinhold, 1977), includes very little in the way of critical comment. What will be best is when we don't need two handbooks and separate journals but can argue the issues out together. •

Although she is one of the contributors to this volume, we invited Dr. Blackmore to be our reviewer because of her experience and insights as a respected and fair-minded researcher in, and observer of, parapsychology.—ED.

Some Recent Books

Listing here does not preclude a more detailed review in a future issue.

Gardner, Martin, ed. *The Wreck of the Titantic Foretold?* Prometheus Books, Buffalo, 1986, 157 pp., cloth, $18.95. Reproduces several writings that seem to foretell the sinking of the *Titantic* and leads reader to see the "familiar blend of unreliable anecdotes with coincidences of the sort that are well within the bounds of normal laws of chance." Gardner's introduction is succinct essay on chance, coincidence, and human misperceptions of both.

Winchell, Wallace William. *Popping Cult Balloons.* Apollo Books, Inc., 107 Lafayette, Winona, MN, 55987, 1985, 70 pp., paper, $4.00. Short satire of cults, designed to encourage those caught up in them to "do yourself the grandest favor of all. Break loose."

—*K.F.*

Articles of Note

Broch, Henri. "Une épée de Domaclès sur l'Education, la Science et la Culture." *European Journal of Science Education,* 7 (1985): 353-360. Article opens discussion of "one of the present requirements of the education system—the preventative treatment of the pseudosciences."

Finke, Ronald A. "Mental Imagery and the Visual System." *Scientific American* (March 1986):88-95. Explores relation between mental imagery and visual perception. Finds that the two share many of the same neural processes in the human visual system.

Oppenheim, Janet. "Physics and Psychic Research in Victorian and Edwardian England." *Physics Today* (May 1986):62-70. Historian examines "a time of public fascination with spiritualism and psychic phenomena," when many British

physicists joined the new Society for Psychical Research.

Russell, Gordon, W., and Jane P. de Graaf. "Lunar Cycles and Human Aggression: A Replication." *Social Behavior and Personality,* 13, no. 2 (1985):143–146. Tests a lunar-aggression hypothesis by using the aggressive penalties awarded in ice hockey over a season of competition. Interpersonal aggression was found to be unrelated to either the synodic or anomalistic cycles, a result consistent with recent views of lunar research. Discusses the persistence of lunar beliefs and their links to expectations and selective exposure.

Silberner, Joanne. "Hypnotism Under the Knife." *Science News,* 129 (March 22, 1986):186–187. Report on the use of hypnosis as an anesthesia in surgery.

Startup, Michael. "The Astrological Doctrine of 'Aspects': A Failure to Validate with Personality Measures." *British Journal of Social Psychology,* 24 (1985):307–315. Three studies tested the astrological doctrine of "aspects." No evidence for the validity of astrological ideas was found in any of them.

Wilford, John Noble. "Fossils of 'Man Tracks' Shown to Be Dinosaurian." *New York Times,* June 17, 1986, C3. Report on paleontologists' new analyses of giant fossil footprints in a riverbed near Glen Rose, Texas, concluding that there is no evidence of human prints mingled with those of dinosaurs. (More details are found in articles by Glen J. Kuban and Ronnie J. Hastings in *Creation/Evolution,* 6, no. 1 [1986].)

—Kendrick Frazier

From Our Readers

The letters column is a forum for views on matters raised in previous issues. Letters are more likely to be published if they are brief and typed double-spaced. They may be edited for space and clarity.

Science and pseudoscience

First, Happy Birthday to CSICOP, and congratulations to all concerned for ten years of useful endeavors in behalf of science. Second, congratulations to the SKEPTICAL INQUIRER for its Tenth Anniversary issue (Spring 1986), which was a fine one that I enjoyed reading.

Third, at the risk of alienating that arch alien-describer Isaac Asimov, let me say that he doesn't see the "science versus pseudoscience" issue in the same way I see it. Many psychologists believe that belief systems exist in order to help us reduce uncertainty; that's more or less what Asimov says. However, he fails to notice that science is merely a more effective way of reducing uncertainty (in the long run) than is pseudoscience. Both are belief systems, and both are built on faith, not reason. Science is more demanding, in that it takes lots of education and experience to "think" in rational ways. But *as a system*, science's main psychological value to humanity is that, like pseudoscience (and religion, for that matter), it gives us the feeling that we can predict and control our future inputs and thus lower the stress associated with unpredictability and loss of control. Science succeeds not in spite of the fact that it offers "uncertainty and insecurity" (as Asimov claims), but because using these concepts gives us far greater and more measurable control of our destinies than do pseudoscientific concepts *despite* the effort involved in mastering scientific concepts.

As for Asimov's claim that science is based primarily on "evidence" and "facts," that's nice in theory but wrong in practice. As anyone who's studied either the history or the sociology of science knows only too well, long-held conclusions in science are seldom overthrown "suddenly" because of "new evidence," as ample numbers of studies have shown. Paradigm shifts, to use Kuhn's term, are slow to occur. And the *actual behavior of scientists in real life* shifts even more slowly. It took the medical profession more than half a century to start washing its hands after Semmelweiss (and others) showed conclusively that antiseptic measures save lives. Modern geneticists resisted the DNA model for years, and studies suggesting that acquired characteristics can be passed along to subsequent generations are either given euphemistic labels ("cytoplasmic inheritance") or completely ignored in order to maintain the classic Darwinian position (though Darwin himself was a Lamarckian!).

Put more bluntly, scientists are just about as pseudoscientific when it comes to their own behavior (in and outside of the laboratory) as the crackpots are. For example, more than 30 years ago Robert Rosenthal showed that scientists tend rather systematically to bias their laboratory observations. CSICOP often takes psi researchers to task for not providing

safeguards against "experimenter bias," but I'd guess that less than 10 percent of the published studies *in all fields of science* include the use of similar precautions! I've seen more examples of data-fudging in the lab (most of it unconscious) than I care to mention—and some of the worst instances were by a Nobel Prize laureate in chemistry! Scientists are almost as likely to impose their values and expectations on "objective evidence" as the crackpots are. A few of the best scientists have always realized this was the case, of course. Years ago, Luis Alvarez (Nobel Prize in physics, 1971) told me why he wouldn't believe his own results until someone replicated them. He began by drawing a straight line on a sheet of paper, the line representing a "data curve." Then he put in a tiny "blip" in the middle of the line. "See that blip? If my theory says it shouldn't be there, then the blip is 'random error.' But if my theory says it should be there, the blip proves my theory is right." That's the way most physicists think, Alvarez suggested. And, indeed, that's the way most *people* think, scientists and crackpots alike!

Pretending scientists are somehow "better" or "more rational" than pseudoscientists just doesn't cut the mustard. We should put our own house in order first. Maybe if we learn how to get *scientists* to practice what they preach, we'll discover appropriate and effective ways of getting the nonscientists to change their ways.

James V. McConnell
Professor of Psychology
University of Michigan
Ann Arbor, Mich.

Isaac Asimov replies:

Dr. McConnell points out that individual scientists are human beings with all the foibles, faults, and weaknesses of human beings. I know this well, as do all scientists.

However, science, as a belief system, *is self-correcting and scientists who go wrong, for whatever reason, are eventually corrected by other scientists.*

In pseudoscience I encounter no such correction by pseudoscientists, whereas attempted corrections by scientists are met with deadly hostility.

To put it as briefly as possible: Science gets somewhere given time, and pseudoscience does not. I consider this a huge difference.

The uses of credulity

I thoroughly enjoyed the Tenth Anniversary issue of the SKEPTICAL INQUIRER (Spring 1986) and especially the essays included. However, I'm moved to comment on one of L. Sprague de Camp's statements.

"A completely rational ideology," writes de Camp (pp. 216-217), "would leave its adherents free ruthlessly to pursue their own selfish desires without scruple or limit. Many do so now; we call them criminals."

I don't buy this for a minute. Does de Camp really believe that all secular humanists, atheists, and unbelievers of every stripe are "pursuing their own selfish desires without scruple or limit"? Is he? Doesn't he know that the prisons of the world are filled with true believers (especially just before their parole board hearings)? Have the religiously inspired atrocities reported in daily papers escaped his notice?

I can only speak for myself, but my record is as good as those of many Christians I know. I've never been arrested for anything more sinister than going 45 miles an hour in a 30-mile zone. I don't murder, steal, or lie about my neighbors; and, while I have been tempted to covet things belonging to my neighbor, I have chosen to refrain from taking any further steps. And I don't need the threat of hell or the hope of heaven to keep me on the straight and narrow. I feel confident the same holds true for Mr. de Camp and most, if not all, of the religious skeptics I know.

I feel that a "completely rational ideology" is the first step toward a truly moral life and that the baseless credulity he seems to recommend is one of our

greatest social problems.

David Cobb
Brentwood, Tenn.

If de Camp thinks that criminals "ruthlessly pursue their own selfish desires without scruple or limit," he is sadly ignorant of understanding criminal behavior. If he thinks that humans need religious ideologies to be altruistic, then he is in the peculiar situation of suggesting that we are not capable of living according to a humanistic ideology, invented by us in the first place, but must invent gods to tell us that our ideas are okay. Since both are inventions, why does it have to be so complicated?

Bertram Rothschild
Aurora, Colo.

I couldn't disagree with de Camp more. Criminals think in terms of immediate gratification, are unable to appreciate the future consequences of their actions, and are therefore the best examples of *irrational* thinking.

I would contend that a "completely rational ideology" would be one that produces the most happiness for the individual in the long run. One doesn't have to be a fanatical libertarian or Randian Objectivist to envision a "completely rational ideology" having its foundation in a commitment to refrain from violence and aggression against other people and their property (self-defense excepted), being basically friendly, and being a good neighbor. Isn't it completely rational to expect this lifestyle to produce more happiness and contentment, certainly in the long run, than being a brute murderer, rapist, thief, etc.?

James G. Lee
Jackson, Miss.

De Camp seems to say that the only completely rational ideology would be a ruthlessly selfish one. This is by no means obvious. The issue is closely related to the much-argued and paradoxical problem of the non-zero-sum game and therefore involves matters that are not as yet fully understood, but which we can hope someday will be. I believe that one can rationally conclude that, if we all really adhered to a common altruistic ethic similar to that taught by most well-known religions (whether or not we also accepted their cosmological and historical assertions), then the world would be better off. Alas, one can then go on to observe that in such a situation an individual could profit by being selfish, provided that most people remained altruistic. If this observation then led everyone into being entirely selfish, disaster would follow. All this is sufficiently puzzling that I do not think that one should say that conventionally ethical behavior is evidence of irrationality.

John G. Fletcher
Pleasanton, Calif.

De Camp writes that Buddhists "must" accept "on faith" the concept of reincarnation. That's a belief of Mr. de Camp's that is decidedly not true.

As a student of Buddhism, I assure you that there is nothing in science that isn't perfectly agreeable to many Buddhists and that "don't-know mind" is considered to be Buddha-mind. "Don't know" is the critical attitude of the skeptic. Isn't that what skeptical inquiry is about? I found Mr. de Camp's article to be otherwise excellent.

Hank Sutter
Winslow, Ark.

I must congratulate you and CSICOP on its tenth anniversary and especially on the consistent high quality of the material in the SKEPTICAL INQUIRER. The tenth-anniversary essays by Asimov, de Camp, Sagan, and Kurtz are a superb treatment in brief of the underlying drives in the irrational mind.

Charles Stats
Oak Park, Ill.

L. Sprague de Camp replies:

Messrs. Cobb, Rothschild, et al., make some good points; but our differences concern choice of words more than basic meaning. These points could be cleared up, but not within an article's limitations. Thus, some object to my use of "altruism." I could have said instead: "The drive or tendency of most human beings, varying among individuals, to act in an unselfish or cooperative manner toward certain other human beings, derived in varying proportions from an inherent drive or quasi-instinct, the commands of parents and others in authority, imitation of persons chosen as role models, established habit, fear of consequences of rule-breaking either in this world or the next, and farsighted enlightened self-interest." I obviously could not repeat this formula every time the matter came up.

Cobb's virtuous "secular humanists, atheists, and unbelievers" adhere to ideologies as much as religious fundamentalists, save that these creeds are secular. I mentioned Confucianism, Stoicism, and and Marxism in this connection; but there are many more. As for religious atrocities, I noted that any ideology tends to get out of hand. The most egregious recent case was the Khmer Rouge rule in Cambodia, where a secular philosophy served as a pretext for killing about a quarter of the population.

As for the benevolence of Lee's "completely rational ideology," desires (including those to do others well or ill) are neither rational nor irrational, but emotional. What is rational or irrational is how one seeks them. If a man wants adulterous intercourse with another's wife, the desire is not rational but emotional. If he calculates that his chances of being shot by her husband are only one in fifty (higher in Texas), that is a rational inference. Then his desire may be strong enough to impel him to take the chance, or again it may not be. If on the other hand he refrains, not because of rational calculation but because he believes that God forbade it in Exodus 20:14, that is an irrational reason, though the results may be more satisfactory all around.

Lee also ignores the time element. If one dwells in a milieu where the life expectancy is short, e.g., among the warlike Comanches or in a crime-ridden modern slum, it might be more rational to take what fun one can get, by fornication, theft, drugs, murder, etc., because one will soon be dead anyway.

According to what I read about Buddhism (pace, Mr. Sutton), despite the Buddha's eloquent denunciations of dogmatism, belief in reincarnation passed from Brahmanism into Thereavadic Buddhism at an early stage. It is implicit in the doctrine of "escape from the Wheel of Rebirth." Most Indians of Gautama's time took it for granted, just as the three Near Eastern monotheisms (Judaism, Christianity, Islam) have taken for granted a life after death with rewards and punishments for deeds in mortal life. Whether the Theravada should be classed as a religion or a secular philosophy (one can argue either), it is still an ideology.

Pseudoscience as entertainment

As a layman interested in the question of why so many people seem taken by and taken in by paranormal claims, I feel one important fact is being missed. The clue is in the taken by, not the taken in. Most fans of pseudoscience recognize that it is largely fiction gussied up as fact. They do not read it for education or enlightenment, factual or spiritual, but rather as a variety of entertainment. Bertrand Russell had it right nearly a century ago when he said that the escape from boredom is one of the most powerful drives in human nature. That is why large numbers of people build bunkers in their living rooms, where they crouch behind a flashing screen eight hours every night. It is a Maginot Line across America designed to hold off the forces of personal boredom, and pseudoscience is simply part of this line of defense. So here come all those colorful wizards of the occult, carnival pitchmen like Geller, and now the intellectual transvestites of parapsychology and the full, amusing panoply of the otherworldly kitsch, ready to give

them the best show in town. Carl Sagan knew this when he designed his marvelous "Cosmos" series with its spooky music of the spheres, mysterious ruins, and exotic names like Hypatia.

The question we should be asking more forcefully is why do so many people think that paranormal drivel is interesting and that hard science is not. This is like asking why the majority seems to prefer bad literature, bad art, and even worse music. I do not agree with Mencken that most people have an unfailing instinct for the false. I think we are back to the old familiar question of just what the preponderant values of our society are going to be. But one thing I am sure of. No amount of truth or facts triumphant, and no Randian mopping of the floor with psychics, will do the job we would like to see done, or even make a dent. There's no business like show business.

Robert Owen
San Jose, Calif.

The "missing day" story

Tom McIver's piece on the myths of creationist evangelism (Spring 1986) was most interesting. The "missing day" story goes back at least as far as 1965-66. I understand that the Griffith Park Observatory near Los Angeles was at that time deluged with calls on the subject and had a recorded message denying the story.

John Odencrantz
Dept. of Statistics
University of California
Riverside, Calif.

I would like to point out that the weird story of the NASA computer and Joshua's missing day *could* in fact be true. The explanation is simple. Judging from the references in McIver's article, there seems to be no lack of fundamentalists at NASA. If the computer program was written by a fundamentalist, you can expect that the programmer as a true believer incorporated data on the missing day. But even if this explanation were correct, the story must still be considered a hoax. It would only confirm the old rule of computer people: Garbage in, garbage out.

H. G. Schwarz
Pennington, N.J.

Full moon and behavior

Editor's note: The article "The Moon Was Full and Nothing Happened" (Winter 1985-86) prompted a number of letters from readers. Space permitted our publishing only two (Summer 1986). Most of the letters not published made similar arguments. This response from the authors addresses the two most common arguments raised by correspondents.

David Briggs (Letters, Summer 1986) takes us to task for not including research on births, menstruation, and sexual activity in our review of the literature. If he had consulted our prior publications in this area, he would have found that our computer searches of the literature located several articles on the more romantic aspects of the full moon. Unfortunately, as he correctly guesses, the articles were "insufficient to meet the test of a skeptical meta-analysis." To take one of the studies that Briggs cites as examples, there is no way that an analyst can check claims made by Menaker and Menaker, who did little more than graph apparent relationships between lunar cycles and births. The few studies from which data could be extracted provide little support for common suppositions about the moon's effects on behavior, e.g., Abell and Greenspan, *SI*, Summer 1979; Palmer et al., *Human Biology*, February 1982; Witter, *Amer. Jnl. Obstet. & Gynecol.*, 145, 1983. Other articles contained obvious and serious flaws. For example, Cutler presents results that suggest that menses are more likely to occur when the moon is visible among women whose menstrual cycles match the moon's 29.54-day cycle. Although Cutler's results are suggestive, she does not explain why 78 percent of the women in her sample

were "out of sync" (i.e., had longer or shorter menstrual cycles). In addition, we found that equally significant results were obtained when Cutler's data were lagged from one to six days, which suggests that a disproportionate number of menses also begin when the moon is absent from the sky.

We have focused on Cutler's findings because they run counter to Briggs's claim that "moonlight may have had a substantial effect on our biological heritage." If the moon did, we would expect that fewer rather than more women would report that they were menstruating when the moon was visible, especially since ancient and quite a few modern cultures look on menstruating women as "unclean" (e.g., Leviticus 20:19 and 15:4). If a full moon encourages romance we would expect women to be most receptive at that time, but Cutler claimed to find that more women were menstruating when the moon was full. Yet couples tend to avoid sex when the woman is menstruating: hence, they avoid sex when the moon is full—which is contrary to Briggs's thesis. This illustrates how investigators interpret *any* deviation from chance as support for the lunar hypothesis.

Briggs suggests that "the equal length of the lunar month and the average menstrual cycle (29.5 days) would appear to be more than a coincidence." We reject this conclusion for the following reasons. First, books on human sexuality by Masters, Johnson, and Kolodny, among others, give 28 days as "average," a figure that falls between the periods for the moon's sidereal and synodic cycles. Second, as we noted, Cutler found that 78 percent of her sample had cycles that deviated from this "average"; others have found that a healthy woman's menstrual cycle may be as short as 21 days and as long as 35 days, e.g., Chiazze et al., *Jnl. of the Amer. Med. Assoc.*, 1968, 203. Third, although Briggs is inclined to view this as more than a coincidence, we might point out that the duration of menstrual cycles for monkeys (24-26 days) and chimpanzees (37 days) provides little support for those who appeal to our evolutionary (or biological) heritage. For those struck by coincidences, we might note that opossums are the only creatures we know that also have a 28-day cycle, and cows (but not other primates) give birth to their young after nine months of gestation.

We are willing to concede that individuals may be conditioned by popular songs to think of the moon as a romantic stimulus; as incurable romantics, we see nothing wrong with taking advantage of one's conditioning to steal a kiss when the moon is full.

Those who champion the lunar hypothesis could easily test it by unobtrusively counting the number of cars parked on a lover's lane on full-moon and other nights. Regrettably, researchers in this area have chosen to base their conclusions on convenient batches of archival data, which others have collected, and inappropriate analyses, which mislead rather than enlighten.

I. W. Kelly, University of Saskatchewan
James Rotton, Florida International University
Roger Culver, Colorado State University

Psi and ASIS

Dr. Vaughn S. Zidell's letter to the *Bulletin* of the American Society for Information Science (ASIS), reprinted in *SI*, Winter 1985-86 (p. 108), reflects the controversial nature of psi phenomena. Perhaps other readers missed the conclusion of my article in the *Bulletin*.

While quoting the Congressional Research Service Study, I wrote: "One group is vehemently opposed to and skeptical of PSI research on the grounds that there has never been scientific confirmation of a PSI phenomenon."

Dr. Zidell did not state whether he felt all the laws of physics have been discovered. As a noted physicist, his comments on this aspect of my article would be of interest. Readers can do their own search on AU = Randi. (The listing will not be long.)

Finally, of the 80 people who attended a "metal bending party" at the ASIS

Annual Meeting in Las Vegas, approximately 80 percent succeeded in bending metal. I assume that many of them now have a different view of psi phenomena. At a similar party at Los Alamos, none of the physicists present could bend metal, but their wives and children did.

Emil H. Levine
Laurel, Md.

We might point out that the issue of psi claims has nothing to do with whether "all the laws of physics have been discovered" but with the evidence, or lack of it, put forward for these claims. As for metal bending, the issue is not whether it bends but by what means, mental or muscular. Finally, since Mr. Levine's original article dealt with reports about the paranormal in mainstream scientific journals, we recommend he and other interested persons read David Marks's recent article, "Investigating the Paranormal," in Nature, *320 (March 13, 1986):119-124.*—ED.

The Levy affair

I wish to correct an error that appeared in the correspondence column of the SKEPTICAL INQUIRER (Summer 1985, pp. 396-397). This error appeared in one of my two letters about the controversy between the FRNM and myself over J. B. Rhine's handling of the Levy affair. FRNM has brought to my attention that they never officially requested the council of the Parapsychological Association to censure me for what I originally wrote about this affair in *Fate* magazine. I made this claim in my second letter in that issue and would like to take this opportunity to correct the misunderstanding.

D. Scott Rogo
Northridge, Calif.

Pretense of psychic surgery

I should like to suggest that one of your inquirers undertake a study of psychosurgery as practiced in the Philippines. This is another one of the fringe areas of medicine preying on unfortunate cancer and other victims by pretending to remove their problems by "surgery."

The practitioners are obviously very good with sleight of hand and allow relatives at close hand while they perform their tasks. They massage the area in question and suddenly withdraw and display a large ball of fatty tissue covered with blood. Some of my patients bring photographs of the performances, which look realistic enough. However, it is obvious to me that the blood is deoxygenated and, in many of the photos, partly clotted. Most patients wouldn't realize that this means it was probably removed from some unfortunate chicken or other slaughtered animal earlier in the day and that it is not fresh enough to have been removed from the patient. Most patients don't have this insight, and obviously many people are gullible and fall prey to these charlatans.

Perhaps it would be helpful for many surgeons and oncologists if the SKEPTICAL INQUIRER published an article on this subject.

Richard G. Margolese, M.D., F.R.C.S.
Director, Div. of Oncology
Dept. of Surgery
Sir Mortimer Davis-Jewish General Hospital
Montreal, Quebec, Canada

The Editor responds:

We thank Dr. Margolese for his suggestion and perceptive comments. Although we have not presented a full critique of psychic surgery, several exposés are available. The most detailed is the nine-chapter section "Filipino Psychic Surgeons" in William A. Nolen, M.D., Healing: A Doctor in Search of a Miracle *(Random House, 1974). This book, which recounts Dr. Nolen's first-hand investigations of "psychic surgeons" and "faith healers," is now unfortunately out of print, but it is in many libraries. The chapter "The Medical Humbugs" in James Randi's* Flim-Flam! *(Prometheus 1982) has considerable material on psy-*

chic surgery, including photos of Randi showing one way the manipulation is done. Finally, we excerpt from a short treatment of psychic surgery in Leonard Zusne and Warren H. Jones, Anomalistic Psychology *(Erlbaum, 1982): "The would-be patient must have an implicit faith in magic. . . . Because the procedure is basically a sleight of hand operation, coupled with what goes on in 'ordinary' faith healing, it holds little interest psychologically. Surgical 'incisions' are made with palmed mica slices. A small amount of blood [or juice of betel nuts] produced in one spot looks like a long, heavy cut when drawn out across intact skin. . . . Curling one's fingers while pushing one's hand into the soft abdomen of a patient gives a very realistic impression of the hand's disappearing into the interior of the body."*

Mid-Michigan group

We wish to announce the formation of a group dedicated to rational inquiry in the Mid-Michigan region. The MSU Proponents of Rational Inquiry and the Scientific Method (PRISM) is a group of Lansing-area people dedicated to critical examination of paranormal issues. We offer to the community a local source of expert scientific opinion on various extraordinary claims.

While most of our members are drawn from the Michigan State University community, we are not exclusively limited to the university. Our membership is open to anyone in the area who shares our desire to encourage the use of rational inquiry and the scientific method. We meet the second Tuesday of each month at Abrams Planetarium on campus at 7:30 P.M. For more information, please contact Dave Marks, 221 Agriculture Hall, MSU, East Lansing, MI 48824.

Dave Marks
East Lansing, Mich.

Ultimate Shroud experiment

I noted with interest the item (Spring 1986) on the ability to analyze the Shroud of Turin.

I propose the ultimate experiment to settle the Shroud of Turin "controversy." We simply obtain a loose skin cell or white cell from the bloodstains on the Shroud, remove the nucleus, and clone the gentleman. (The necessary technology will be available within a few years.) We then simply observe whether the resulting cloned human can walk on water! In fact, I co-wrote a movie script based on just this scenario. Clint Eastwood loved the screenplay and bought an option, which, however, he allowed to lapse, apparently because he considered the religious theme a bit too hot to handle (as reported in *Esquire*). The script is currently being passed to various Hollywood producers.

Did the movie clone turn out to be Jesus Christ? You'll have to see the movie to find out!

Sandy Shaw
Palos Verdes Estates, Calif.

Local Organizations

(groups with aims similar to CSICOP's)

Arizona

Tucson Skeptical Society (TUSKS). Ken Morse and James McGaha, Co-chairmen, 2509 N. Campbell Ave., Suite #16, Tucson, AZ 85719.

California

Bay Area Skeptics. Robert Sheaffer, Chairman, P.O. Box 60, Concord, CA 94522-0060.

Sacramento Skeptics Society. Terry Sandbek, 4095 Bridge St., Fair Oaks, CA 95628.

San Diego Skeptics. Elié Shneour, Chairman, Box 17566, San Diego, CA 92117.

Southern California Skeptics. Al Hibbs, Chairperson, Al Seckel, Executive Director, P.O. Box 7000-39, Redondo Beach, CA 90277.

Colorado

Colorado Organization for a Rational Alternative to Pseudoscience (CO-RAP). Béla Scheiber, Director, P.O. Box 7277, Boulder, CO 80306.

Hawaii

Quackery Action Council. Kurt Butler and Alicia Leonhard, Directors, P.O. Box 1077, Haleiwa, HI 96712.

Illinois

Midwest Committee for Rational Inquiry. Contact persons, Sandy Smolinsky, Andrew Skolnick, P.O. Box 268375, Chicago, IL 60626.

Michigan

Detroit Association for Rational Inquiry (DARE). Contact person, G. L. Ellery, P.O. Box 19580, Detroit MI 48219.

Minnesota

Minnesota Skeptics. Robert W. McCoy, 549 Turnpike Rd., Golden Valley, MN 55416.

New York

New York Committee for Skeptical Inquiry (NYCSI). Terence Hines, 51 Westchester Ave., Thornwood, NY 10594.

Western New York Skeptics. Contact person, Barry Karr, 3151 Bailey Ave., Buffalo, NY 14215.

Ohio

South Shore Skeptics. Page Stephens, 1346 W. 64th St., Cleveland, OH 44102

Oregon-Idaho

Northwest Skeptics. John Merrell, Oregon-Idaho Coordinator, P.O. Box 5027, Beaverton, OR 97007.

Pennsylvania

Paranormal Investigating Committee of Pittsburgh (PICP). Richard Busch, Chairman, 5841 Morrowfield Ave., #302, Pittsburgh, PA 15217.

Texas

Austin Society to Oppose Pseudoscience (A-STOP). Lawrence Cranberg, President, P.O. Box 3446, Austin, TX 78764.

Dallas Society to Oppose Pseudoscience (D-STOP). James P. Smith, Science Div. of Brookhaven College, Dallas, TX 75234.

Houston Society to Oppose Pseudoscience (H-STOP). David Smith, Chairman, P.O. Box 541314, Houston, TX 77254.

Washington

Northwest Skeptics. Michael R. Dennett, Chairman, Washington Coordinator, 4927 SW 324th Place, Federal Way, WA 98023.

West Virginia

Committee for Research, Education, and Science Over Nonsense (REASON). Steven Cody, Chairperson, Dept. of Psychology, Marshall University, Huntington, WV 25701.

Wisconsin

Skeptics of Milwaukee. Len Shore, 3489 N. Hackett Ave., Milwaukee, WI 53211.

The Committee for the Scientific Investigation of Claims of the Paranormal

Paul Kurtz, Chairman

Scientific and Technical Consultants

William Sims Bainbridge, professor of sociology, University of Washington, Seattle. **Gary Bauslaugh**, dean of echnical and academic education and professor of chemistry, Malaspina College, Nanaimo, British Columbia, Canada. **Richard E. Berendzen**, professor of astronomy, president, American University, Washington, D.C. **Barry L. Beyerstein**, professor of psychology, Simon Fraser University, Burnaby, British Columbia, Canada. **Richard Busch**, musician and magician, Pittsburgh, Pa. **Charles J. Cazeau**, associate professor of geological sciences, SUNY, Buffalo. **J. Dath**, professor of engineering, Ecole Royale Militaire, Brussels, Belgium. **Sid Deutsch**, professor of bioengineering, Tel Aviv University, Israel. **J. Dommanget**, astronomer, Royale Observatory, Brussels, Belgium. **Natham J. Duker**, assistant professor of pathology, Temple University. **Frederic A. Friedel**, philosopher, Hamburg, West Germany. **Robert E. Funk**, anthropologist, New York State Museum & Science Service. **Sylvio Garattini**, director, Mario Negri Pharmacology Institute, Milan, Italy. **Laurie Godfrey**, anthropologist, University of Massachusetts. **Gerald Goldin**, mathematician, Rutgers University. **Donald Goldsmith**, astronomer; president, Interstellar Media. **Clyde F. Herreid**, professor of biology, SUNY, Buffalo. **I. W. Kelly**, professor of psychology, University of Saskatchewan. **Richard H. Lange**, chief of nuclear medicine, Ellis Hospital, Schenectady, New York. **Gerald A. Larue**, professor of biblical history and archaeology, University of So. California. **Bernard J. Leikind**, staff scientist, GA Technologies Inc., San Diego. **Joel A. Moskowitz**, director of medical psychiatry, Calabasas Mental Health Services, Los Angeles. **Joe Nickell**, technical writing instructor, University of Kentucky. **Robert B. Painter**, professor of microbiology, School of Medicine, University of California. **John W. Patterson**, professor of materials science and engineering, Iowa State University. **Steven Pinker**, assistant professor of psychology, MIT. **James Pomerantz**, professor of psychology, SUNY, Buffalo. **Daisie Radner**, professor of philosophy, SUNY, Buffalo. **Michael Radner**, professor of philosophy, McMaster University, Hamilton, Ontario, Canada. **Robert H. Romer**, professor of physics, Amherst College. **Milton A. Rothman**, physicist, Philadelphia, Pa. **Karl Sabbagh**, journalist, Richmond, Surrey, England. **Robert J. Samp**, assistant professor of education and medicine, University of Wisconsin-Madison. **Steven D. Schafersman**, geologist, Houston. **Eugenie Scott**, physical anthropologist, University of Colorado-Boulder. **Stuart D. Scott, Jr.**, associate professor of anthropology, SUNY, Buffalo. **Erwin M. Segal**, professor of psychology, SUNY, Buffalo. **Elie A. Shneour**, biochemist; director, Biosystems Research Institute, La Jolla, California. **Steven N. Shore**, New Mexico Institute of Mining and Technology, Socorro, N.M. **Barry Singer**, psychologist, Seal Beach, Calif. **Mark Slovak**, astronomer, University of Wisconsin-Madison. **Douglas Stalker**, associate professor of philosophy, University of Delaware. **Gordon Stein**, physiologist, author; editor of the *American Rationalist*. **Waclaw Szybalski**, professor, McArdle Laboratory, University of Wisconsin-Madison. **Ernest H. Taves**, psychoanalyst, Cambridge, Massachusetts.

Subcommittees

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Education Subcommittee: Co-chairmen, James E. Alcock, Glendon College, York University, 2275 Bayview Ave., Toronto, and John R. Cole, 22 Slate Creek Road, #11, Cheektowaga, N.Y. 14227.

Paranormal Health Claims Subcommittee: Co-chairmen, William Jarvis, Chairman, Department of Public Health Science, School of Allied Health Professionals, Loma Linda University, Loma Linda, CA 93350, and Stephen Barrett, M.D., P.O. Box 1747, Allentown, PA 18105.

Parapsychology Subcommittee: Chairman, Ray Hyman, Psychology Dept., Univ. of Oregon, Eugene, OR 97402.

UFO Subcommittee: Chairman, Philip J. Klass, 404 "N" Street S.W., Washington, D.C. 20024.

International Committees (partial list)

Australia: Australian Skeptics, National Secretariat, Box 575, Manly, N.S.W. 2095. **Belgium:** J. Dommanget, Observatoire Royal de Belgique, Avenue Circulaire 3, B-1180 Brussels. **Canada:** James E. Alcock (chairman), Glendon College, York University, 2275 Bayview Ave., Toronto; Henry Gordon (media consultant), Box 505, Postal Station Z, Toronto M5N 2Z6. **Ecuador:** P. Schenkel, Casilla 6064 C.C.I., Quito. **France:** Maurice Gross and Yves Galifret, Comité Français pour l'Etude des Phénomènes Paranormaux, 16 Rue de l'Ecole Polytechnique, Paris 5. **Great Britain:** Michael J. Hutchinson, 10 Crescent View, Loughton, Essex. **Mexico:** Mario Mendez-Acosta, Apartado Postal 19-546, Mexico 03900, D.F. **New Zealand:** David Marks, University of Otago, Dunedin. **Norway:** Jan S. Krogh, Norwegian Institute of Scientific Research and Enlightenment, P.O. Box 990, N-9401, Harstad. **Spain:** Luis Alfonso Gámez Domínguez, el Almirante A. Gaztañeta, 1-5º D, 48012 Bilbao. **Sweden:** Sven Ove Hansson, Box 185, 101 22, Stockholm 1.

The Committee for the Scientific Investigation of Claims of the Paranormal

The Committee for the Scientific Investigation of Claims of the Paranormal attempts to encourage the critical investigation of paranormal and fringe-science claims from a responsible, scientific point of view and to disseminate factual information about the results of such inquiries to the scientific community and the public. To carry out these objectives the Committee:

- Maintains a network of people interested in critically examining claims of the paranormal.
- Prepares bibliographies of published materials that carefully examine such claims.
- Encourages and commissions research by objective and impartial inquiry in areas where it is needed.
- Convenes conferences and meetings.
- Publishes articles, monographs, and books that examine claims of the paranormal.
- Does not reject claims on a priori grounds, antecedent to inquiry, but rather examines them objectively and carefully.

The Committee is a nonprofit scientific and educational organization. THE SKEPTICAL INQUIRER is its official journal.